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A summary of graduate degrees awarded by the land-grant institutions over the past decade and a more detailed analysis of graduate degrees conferred by each land-grant institution in 1958–59, classified by major academic fields. Figures cited show that the land-grant institutions are making a major contribution to the Nation's total accomplishments in graduate education and that the land-grant share of the total has been a growing one.

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U. S. DEPARTMENT OF
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A Statistical Analysis of Graduate Degrees Awarded by Land-Grant Institutions in 1958-59

by
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Introduction

In August 1961, President Kennedy issued a proclamation commemorating the centennial of the Morrill Act establishing the land-grant colleges. The President asked the cooperation of all agencies of the Federal Government "to the end that the occasion may serve to commemorate the unparalleled opportunities for higher education provided by these publicly supported institutions and their efforts through teaching, research, and service to improve the economic, social and cultural lives of the people of this Nation and of other nations."[1/]

The U.S. Office of Education has from the beginning had a special relationship with the land-grant institutions, which regularly report to it on their progress each year.[2/] The Office is therefore happy to comply with the President's request, in part, by publishing this summary of graduate degrees awarded by the land-grant institutions over the past decade, and by providing a more detailed analysis of the degrees conferred in 1958-59.

The Introduction, with tables 1 and 2, presents data showing the number of graduate degrees awarded by each of the land-grant institutions and by all United States institutions, for each year from 1949-50 through

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1/ Proclamation from the White House at Hyannis Port, Mass., August 26, 1961.

2/ The latest annual volume is Statistics of Land-Grant Colleges and Universities, Year Ended June 30, 1959, Circular No. 639, by George Lind (Washington: U.S. Government Printing Office, 1961).

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1958-59 and for the 10-year period. Part I, with tables 3 through 12, presents a detailed analysis of doctor's degrees awarded by the land-grant institutions in 1958-59, by major academic area; and Part II, with tables 13 through 22, offers a similar analysis of master's-level degrees. In Part III, with tables 23 through 27, a summary is given, along with some concluding observations.

A few comments on the trends revealed by tables 1 and 2 will serve as introduction to and background for the more detailed discussion to follow in other sections of this report.[3/]

Table 1 shows the number of doctor's degrees awarded annually by each of the land-grant institutions over the 10-year period, 1949-50 through 1958-59; the total number of doctorates awarded by all U.S. institutions; and land-grant degrees as a percent of the U.S. total.

The growth in the number of doctorates awarded over the entire decade can be summarized as follows:

	1949-50	1958-59	Percent increase[4/]
All institutions	6,415	9,360	46
Land-grant institutions	2,340	3,583	53
Other institutions	4,075	5,777	42

Thus the percentage increase of doctorates awarded by the land-grant institutions was considerably greater than that of all other U.S. institutions. The numerical increase in land-grant doctorates was 1,243, compared with an increase of 1,702 awarded by other U.S. institutions.

A further examination of the table shows that 33 of the land-grant institutions awarded doctorates in 1949-50, 42 awarded doctorates in 1958-59, and 43 awarded doctorates sometime during the decade.[5/] The nine institutions which did not award doctorates in 1949-50, but which did in 1958-59, accounted for only 58 of the increase in 1958-59 of 1,243 doctorates awarded between the two terminal years--less than 5 percent of the numerical increase.

[3/] All degree data in this report, and the classification of degrees by field, are taken from the annual publications of the Office of Education, Earned Degrees Conferred by Higher Education Institutions, for the years 1949-50 through 1958-59.

[4/] Percentages in this report have generally been rounded to the nearest whole number, since the data do not warrant greater precision.

[5/] A list of the 68 land-grant institutions is shown on page 51.

Table 1.--Doctorates in All Fields Awarded by All Institutions, by All Land-Grant Institutions, and by Each Land-Grant Institution: Aggregate United States, 1949-50 Through 1958-59

Institution	Total doctorates	1949 - 1950	1950 - 1951	1951 - 1952	1952 - 1953	1953 - 1954	1954 - 1955	1955 - 1956	1956 - 1957	1957 - 1958	1958 - 1959
1	2	3	4	5	6	7	8	9	10	11	12
(Land-grant degrees as percent of those awarded by all institutions)	37.8	36.5	35.7	37.0	36.2	39.2	39.3	37.9	37.9	37.7	38.3
Total degrees, all institutions	83,542	2/ 6,415	7,338	7,683	8,309	8,996	8,840	8,903	8,756	8,942	9,360
Total degrees, land-grant institutions	31,573	2,340	2,617	2,844	3,126	3,530	3,470	3,374	3,317	3,372	3,583
Auburn University	38	0	0	0	0	0	5	7	3	13	10
University of Alaska	4	0	0	0	0	0	1	0	2	1	0
University of Arizona	54	2	2	1	3	2	7	8	5	7	17
University of Arkansas	88	0	0	0	8	12	13	12	15	14	14
University of California	4,364	322	365	431	424	518	468	452	455	476	453
Colorado State University	12	0	0	0	0	0	1	0	2	4	5
University of Connecticut	237	7	5	10	19	17	32	28	34	37	48
University of Delaware	201	23	17	14	24	26	17	24	20	21	15
University of Florida	564	16	32	29	53	75	66	83	68	68	74
University of Georgia	50	0	3	4	2	3	8	8	8	9	5
University of Hawaii	15	0	1	0	2	1	2	0	2	3	4
University of Illinois	2,960	222	239	249	312	340	343	291	281	351	332
Purdue University	1,721	138	121	149	157	178	201	196	188	216	177
Iowa State University	1,195	101	108	117	125	140	116	132	119	133	104
Kansas State University	173	8	8	16	18	13	16	21	30	20	18
University of Kentucky	278	16	28	32	21	34	29	32	20	23	43
Louisiana State University	435	24	25	26	39	53	45	57	44	55	67
University of Maryland	716	36	46	67	56	80	79	78	82	102	90
Massachusetts Institute of Technology	1,659	166	166	150	178	155	171	157	171	153	192
University of Massachusetts	110	11	10	13	13	7	11	10	11	8	16
Michigan State University	1,112	40	54	77	136	119	137	121	152	131	145
University of Minnesota	2,167	163	195	197	205	254	223	230	239	221	240
Mississippi State University	4	0	0	0	2	0	1	0	0	0	1
University of Missouri	720	64	64	74	61	88	82	77	65	70	75
Montana State College	15	0	0	0	0	0	0	2	0	4	9
University of Nebraska	480	29	36	34	58	52	59	50	54	48	60
University of New Hampshire	15	0	0	0	0	0	0	0	2	5	8
Rutgers, The State University	650	49	50	48	53	77	52	76	79	68	98
University of North Carolina State College of A & E	216	12	9	11	17	25	24	24	34	24	36
Cornell University	2,193	210	261	244	228	227	230	207	187	188	211
The Ohio State University	2,530	229	259	271	272	251	264	243	227	261	253
Oklahoma State University	222	6	15	23	22	23	22	28	30	18	35
Oregon State University	397	20	29	34	39	46	52	68	35	41	33
The Pennsylvania State University	1,258	70	96	113	131	157	157	149	130	126	129
South Dakota State College	2	0	0	0	0	0	0	0	0	0	2
University of Tennessee	361	13	14	30	28	44	41	42	47	46	56
A & M College of Texas	273	9	15	16	19	39	32	26	37	34	46
Utah State University	42	2	2	1	1	1	1	9	7	9	9
Virginia Polytechnic Institute	85	5	5	5	7	5	7	13	10	16	12
Washington State University	284	17	11	24	36	29	26	44	33	26	38
West Virginia University	80	3	6	4	8	10	10	9	12	7	11
University of Wisconsin	3,477	299	317	325	336	409	401	349	365	303	373
University of Wyoming	116	8	3	5	13	15	18	11	12	12	19

1/See table 47 for complete list of land-grant institutions, by State.

2/The previously published figure of 6,633 doctor's degrees in 1949-50 has been found to be in error as the result of an incorrect entry on one of the degree-reporting forms for that year. The corrected figure above was obtained directly from the historical records of the institution concerned.

NOTE: Aggregate United States includes the 50 States, the District of Columbia, and outlying parts; the University of Puerto Rico is the only land-grant institution in the outlying parts.

Table 2 indicates that 60 of the land-grant institutions awarded approximately 25 percent of the master's-level degrees[6/] conferred by all U.S. institutions during the decade. The total U.S. increase was 11,278, or 19 percent; for the land-grant degrees the increase was 3,196, or 22 percent. The numerical increase in degrees awarded at the master's level was, therefore, as at the doctor's level, greater in the land-grant institutions than in U.S. institutions as a whole. However, the number of land-grant degrees as a percent of all degrees was only slightly greater (less than 1 percent) in 1958-59 than it had been 10 years earlier--28 percent of the total.

From tables 1 and 2 one can gain some impression of the extent of institutional strength within the land-grant group. Among the land-grant institutions are five universities which ranked among the first ten in the Nation in the number of earned doctorates awarded during the decade. These five are, in order, the Universities of California (all campuses), Wisconsin, Illinois, Ohio State, and Cornell. Together they awarded 15,524 doctorates, or 49 percent of all land-grant doctorates during the decade. The next five land-grant institutions awarding the largest number of doctorates were, in order, the University of Minnesota, Purdue, Massachusetts Institute of Technology, Pennsylvania State University, and Iowa State University, which together awarded 8,000 doctorates. Thus, the 10 land-grant universities awarding the largest number of degrees conferred 23,524 doctorates, or 75 percent of all land-grant doctorates during the decade. Furthermore, these 10 land-grant institutions rank among the top 25 in the nation in the number of doctor's degrees awarded in the last decade.

At the master's-degree level, concentration in the largest universities was proportionately less. The five land-grant institutions awarding the largest number of master's-level degrees were, in order, the Universities of California, Illinois, Wisconsin, Minnesota, and Ohio State. Together they awarded 50,381 such degrees, or 33 percent of the land-grant total during the decade. The next five were, in order, Purdue, Louisiana State University, Massachusetts Institute of Technology, Michigan State, and Pennsylvania State Universities. Together these 10 universities awarded 75,869 degrees, or 50 percent of the land-grant total. Thus the top five universities, and the top 10 (in terms of number of degrees granted), awarded smaller percentages of all land-grant degrees at the master's level, than did the comparable institutions at the doctorate level.

The figures cited above show that the land-grant institutions are making a major contribution to the nation's total accomplishments in graduate education, and that the land-grant share of the total has been a growing one. It is generally agreed by those who have studied the situation that American society will benefit from a rapid and orderly expansion in the number of individuals holding

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[6/] The category "master's-level degrees" is used throughout this study for "second-level" degrees in the classification used in the annual earned degrees surveys of the Office of Education. This term includes all master's degrees except those which are awarded as first-professional degrees.

Table 2--Masters-Level Degrees in All Fields Awarded by All Institutions, by All Land-Grant Institutions, and by Each Land-Grant Institution: Aggregate United States, 1949-50 Through 1958-59

Institution	Total master's degrees	1949 - 1950	1950 - 1951	1951 - 1952	1952 - 1953	1953 - 1954	1954 - 1955	1955 - 1956	1956 - 1957	1957 - 1958	1958 - 1959
1	2	3	4	5	6	7	8	9	10	11	12
(Land-grant degrees as percent of those awarded by all institutions)	24.5	24.7	25.5	24.3	23.3	24.1	24.3	24.2	24.6	24.5	25.3
Total degrees, all institutions	619,348	58,219	65,132	63,587	61,023	56,823	58,204	59,294	61,955	65,614	69,497
Total degrees, land-grant institutions	151,634	14,353	16,582	15,418	14,198	13,709	14,138	14,328	15,265	16,094	17,549
Auburn University	1,920	128	159	208	185	199	187	209	253	172	220
University of Alaska	51	0	0	2	4	4	3	6	3	7	22
University of Arizona	1,588	168	110	95	145	162	158	155	175	223	197
University of Arkansas	3,907	261	378	413	431	438	427	439	423	355	342
University of California	12,642	1,233	1,486	1,237	1,152	1,005	1,124	1,113	1,208	1,460	1,624
Colorado State University	1,017	81	100	92	102	100	114	110	90	88	140
University of Connecticut	2,418	119	169	272	236	227	224	284	273	301	313
University of Delaware	1,251	71	133	118	101	142	122	157	144	132	131
Florida A & M University	718	4	10	12	34	68	88	83	140	132	147
University of Florida	3,999	382	504	426	392	387	378	375	376	411	368
Fort Valley State College	5	0	0	0	0	0	0	0	0	1	2
University of Georgia	1,971	176	222	209	192	196	169	220	187	191	209
University of Hawaii	510	34	50	42	40	31	32	163	28	39	51
University of Idaho	1,188	111	134	112	83	114	106	128	138	112	150
University of Illinois	12,345	1,399	1,554	1,468	1,139	1,046	1,070	1,017	1,119	1,186	1,347
Purdue University	4,512	499	473	445	382	358	394	449	458	521	533
Iowa State University	2,209	242	294	224	193	181	185	220	216	199	255
Kansas State University	1,625	69	213	209	134	142	138	148	177	180	215
University of Kentucky	2,943	300	318	310	282	246	294	255	315	293	330
Louisiana State University	4,222	370	456	363	409	393	407	430	549	449	396
University of Maine	1,260	88	88	133	113	103	163	148	117	157	150
University of Maryland	2,911	240	291	338	309	268	260	318	287	279	321
Massachusetts Institute of Technology	5,911	504	541	517	487	575	564	549	680	698	796
University of Massachusetts	961	94	123	85	93	83	87	77	100	88	131
Michigan State University	5,105	424	483	469	416	401	444	393	587	672	816
University of Minnesota	8,518	934	963	920	896	685	746	797	845	866	866
Mississippi State University	1,250	57	122	113	133	154	169	152	122	115	113
Lincoln University	32	0	1	2	0	3	1	10	4	5	6
University of Missouri	4,071	479	495	487	378	368	348	335	369	372	440
Montana State College	514	41	34	47	32	49	43	50	60	68	90
University of Nebraska	2,663	154	366	298	231	269	258	267	266	255	299
University of Nevada	177	6	10	5	7	11	10	27	40	27	24
University of New Hampshire	713	98	72	69	75	75	95	58	51	62	58
Rutgers, The State University	3,242	403	332	321	298	291	231	225	262	383	496
New Mexico State University, A, E, & S	432	13	30	29	35	44	44	60	55	60	62
Cornell University	3,816	427	450	324	374	379	345	368	350	404	395
A & T College of North Carolina	788	11	15	29	54	65	126	129	111	121	117
University of North Carolina State College of A & E	1,094	86	84	117	120	103	110	120	123	108	123
North Dakota State University	394	23	21	29	18	24	44	49	60	69	57
The Ohio State University	7,304	794	974	847	648	674	616	648	680	650	773
Oklahoma State University	4,040	380	406	374	383	386	434	425	395	407	450
Oregon State University	1,992	150	189	178	170	190	213	180	176	276	270
The Pennsylvania State University	5,738	492	632	616	582	550	583	542	540	586	615
University of Puerto Rico	121	2	5	9	20	0	4	13	15	28	25
University of Rhode Island	297	10	17	20	27	31	42	31	40	41	38
Clemson Agricultural College	274	14	22	13	15	29	28	19	46	42	46
South Carolina State College	685	11	38	38	62	89	46	101	82	105	113
South Dakota State College	398	16	18	21	10	25	26	43	63	77	99
Tennessee A & I State University	578	24	24	51	40	51	61	68	88	82	89
University of Tennessee	3,029	294	347	336	278	268	272	266	297	328	343
A & M College of Texas	1,690	201	192	192	161	116	151	134	168	176	199
Prairie View A & M College	1,490	66	124	21	210	197	178	192	206	144	152
Utah State University	1,160	111	111	89	102	116	139	109	101	125	157
University of Vermont	523	73	82	62	46	47	48	36	32	48	49
Virginia Polytechnic Institute	1,070	97	113	98	120	90	113	90	91	127	131
Virginia State College	236	26	25	28	31	27	21	23	21	16	18
Washington State University	1,175	138	153	115	141	108	103	100	106	93	118
West Virginia University	3,955	504	528	539	450	393	336	326	319	291	269
University of Wisconsin	9,572	1,087	1,160	1,041	842	809	894	758	901	1,024	1,056
University of Wyoming	1,426	134	138	141	155	124	122	131	137	167	177

1/See table 47 for complete list of land-grant institutions, by State.

a master's or doctor's degree in a wide variety of fields. The decision to offer any particular graduate program, however, must be made by each institution in the light of its own capacities and objectives. Further, graduate work is expensive, and not all institutions at present receiving land-grant funds may continue to receive them in the future. But for those which do, the existence of well-developed graduate programs, and of experience accumulated in operating them, auger well for carefully planned expansion. Society will clearly benefit if the land-grant institutions can make an even greater contribution to graduate work in the next decade than they have in the one just past. This conclusion is the premise which underlies our further discussion of more detailed matters in this report.

Part I--Doctorates Awarded by Land-Grant Institutions in 1958-59

The tables which follow present a more detailed breakdown of the summary figures already shown in table 1. The intent is to show the contribution of each institution, and of the entire land-grant group to total doctoral production in the United States in each major academic field. To do this, the number of doctor's degrees awarded by each land-grant institution, the total for all land-grant institutions, and for all United States institutions, the land-grant degrees as a percent of all United States degrees, are shown for each major area and for individual fields.

1. Doctorates in Agriculture and Forestry

Table 3 shows that 30 land-grant institutions (out of a total of 68) awarded 349 doctoral degrees in agriculture and forestry in 1958-59, and that this number constituted 93 percent of the total awarded by all U.S. institutions. In fact, of the various fields shown, only in forestry were there any doctorates granted by universities which were not land-grant institutions. The fields in which the largest numbers of degrees were awarded were, in declining order, agronomy (81 doctorates), animal husbandry (56), horticulture (55), and soils (39).

Of the total of 349 doctorates awarded by all land-grant institutions, well over one-half were awarded by seven institutions.. Further, two-thirds of all degrees were awarded by 10 institutions; with the remaining 20 institutions awarding slightly less than one-third of the degrees.

2. Doctorates in the Biological Sciences

Doctor's degrees awarded by the land-grant institutions in the biological sciences are shown in table 4. Thirty-five of the land-grant institutions awarded 560 degrees, and these were 54 percent of the total conferred by all U.S. institutions. The largest numbers of doctorates were awarded in biochemistry and biophysics (84), followed by zoology (81), entomology (66), pathology and plant pathology (62), botany (58), and bacteriology, virology, mycology and parasitology (57), with smaller numbers in the remaining fields. Of the 12 fields shown only in general biology and pharmacology were land-grant degrees less than 40 percent of all U.S. degrees. They constituted over 90 percent of the total in three fields, and over one-half in five additional fields. The great strength of the land-grant institutions in the biological sciences, as evidenced by the number of doctoral degrees awarded, is clearly shown by these figures.

At an earlier point we observed that five of the land-grant institutions had awarded 49 percent of all land-grant doctorates during the 1950's. In the biological sciences over 50 percent of all doctorates were awarded by five institutions, and slightly over 74 percent by ten. The five institutions awarding the largest numbers of degrees were, in declining order, the University of California (105), Wisconsin (81), Illinois (41), Cornell (40) and Minnesota (34).

Table 3.--Doctorates in Agriculture and Forestry Awarded by All Institutions, by All Land-Grant Institutions, and by Each Land-Grant Institution, by Field: Aggregate United States, 1958-59

Institution	Total, agriculture and forestry	Agronomy	Animal husbandry	Dairy husbandry	Dairy manufacturing and technology	Farm management	Food technology	Forestry	Horticulture (plain and ornamental)	Poultry husbandry	Soils	Other specific fields
1	2	3	4	5	6	7	8	9	10	11	12	13
(Land-grant degrees as percent of those awarded by all institutions)	93	100	100	100	100	100	100	18	100	100	100	100
Total degrees, all institutions	376	81	56	25	17	1	15	33	55	21	39	33
Total degrees, land-grant institutions	349	81	56	25	17	1	15	6	55	21	39	33
University of Arizona	1	0	0	0	0	0	0	0	0	0	1	0
University of California	10	0	0	0	0	0	0	0	4	0	0	6
University of Connecticut	2	0	2	0	0	0	0	0	0	0	0	0
University of Florida	7	1	1	0	0	0	0	0	1	0	3	1
University of Illinois	25	6	7	0	5	0.	5	0	2	0	0	0
Purdue University	18	6	1	2	0	0	0	0	6	3	0	0
Iowa State University	27	14	9	1	1	0	0	0	1	1	0	0
Kansas State University	4	2	0	0	0	0	0	0	0	0	0	2
Louisiana State University	11	5	0	2	0	0	0	0	1	3	0	0
University of Maryland	9	2	1	3	0	0	1	0	2	0	0	0
University of Massachusetts	3	1	0	0	0	0	2	0	0	0	0	0
Michigan State University	34	4	2	0	3	0	0	1	9	4	7	4
University of Minnesota	14	1	2	4	0	0	0	2	3	0	2	0
Mississippi State University	1	1	0	0	0	0	0	0	0	0	0	0
University of Missouri	7	0	2	2	0	0	0	0	0	0	1	2
University of Nebraska	3	3	0	0	0	0	0	0	0	0	0	0
University of New Hampshire	2	0	0	0	0	0	0	0	2	0	0	0
Rutgers, The State University	23	2	0	1	0	0	5	0	5	1	1	8
Cornell University	30	2	11	2	0	1	0	0	6	0	8	0
University of North Carolina State College of A & E	14	5	6	0	0	0	0	0	0	0	3	0
The Ohio State University	17	2	0	3	1	0	0	0	9	2	0	0
Oklahoma State University	1	0	1	0	0	0	0	0	0	0	0	0
Oregon State University	6	0	3	0	0	0	2	0	1	0	0	0
The Pennsylvania State University	8	5	0	0	1	0	0	0	0	2	0	0
South Dakota State College	1	1	0	0	0	0	0	0	0	0	0	0
A & M College of Texas	20	0	3	3	0	0	0	0	0	4	2	8
Utah State University	6	0	2	0	0	0	0	3	0	0	1	0
Washington State University	10	6	2	0	0	0	0	0	2	0	0	0
University of Wisconsin	32	9	1	2	6	0	0	0	1	1	10	2
University of Wyoming	3	3	0	0	0	0	0	0	0	0	0	0

Table 4.--Doctorates in the Biological Sciences Awarded by All Institutions, by All Land-Grant Institutions, and by Each Land-Grant Institution, by Field: Aggregate United States, 1958-59

Institution	Total, biological sciences	Anatomy and histology	Bacteriology, virology, mycology, and parasitology	Biochemistry and biophysics	Biology, general	Botany, general	Entomology	Genetics	Pathology and plant pathology	Pharmacology	Physiology and plant physiology	Zoology	All other biological sciences 1/
1	2	3	4	5	6	7	8	9	10	11	12	13	14
(Land-grant degrees as percent of those awarded by all institutions) ----	54	43	46	54	20	55	94	91	97	16	52	56	54
Total degrees, all institutions ----------	1,045	37	125	156	147	106	70	42	64	32	81	144	41
Total degrees, land-grant institutions ----------	560	16	57	84	29	58	66	38	62	5	42	81	22
Auburn University ----------	3	0	0	0	0	0	1	0	0	0	0	1	1
University of Arizona ----------	2	0	0	2	0	0	0	0	0	0	0	0	0
University of California ----------	105	9	4	21	7	1	10	2	10	0	20	16	5
Colorado State University ----------	3	0	1	0	0	0	0	0	0	0	0	2	0
University of Connecticut ----------	5	0	2	0	0	0	1	0	0	0	0	2	0
University of Florida ----------	8	0	0	0	5	0	0	0	2	1	0	0	0
University of Georgia ----------	1	0	0	0	0	0	0	0	0	0	0	1	0
University of Hawaii ----------	2	0	0	0	0	0	0	1	0	0	0	1	0
University of Illinois ----------	41	3	7	4	0	5	4	0	7	0	6	5	0
Purdue University ----------	24	0	1	9	14	0	0	0	0	0	0	0	0
Iowa State University ----------	7	0	0	0	0	4	3	0	0	0	0	0	0
Kansas State University ----------	9	0	4	0	0	4	1	0	0	0	0	0	0
University of Kentucky ----------	1	0	1	0	0	0	0	0	0	0	0	0	0
Louisiana State University ----------	12	0	1	2	0	2	0	0	7	0	0	0	0
University of Maryland ----------	11	0	6	0	0	0	1	0	0	1	0	3	0
Massachusetts Institute of Technology ----------	3	0	0	0	2	0	0	0	0	0	0	0	1
Michigan State University ----------	21	0	7	0	0	4	1	0	0	0	2	5	2
University of Minnesota ----------	34	3	2	2	0	4	5	6	3	0	1	4	4
University of Missouri ----------	2	0	0	0	0	0	0	0	0	0	1	1	0
Montana State College ----------	2	0	1	0	0	0	1	0	0	0	0	0	0
University of Nebraska ----------	9	0	0	0	0	2	0	0	0	0	1	6	0
University of New Hampshire ---------	1	0	0	0	0	0	0	0	0	0	0	1	0
Rutgers, The State University ------	33	0	4	4	0	5	3	0	3	0	4	10	0
Cornell University ----------	40	0	1	3	0	2	10	10	6	0	3	5	0
University of North Carolina State College of A & E ----------	10	0	0	0	0	4	2	2	2	0	0	0	0
Ohio State University ----------	22	1	1	1	0	9	5	0	0	0	1	4	0
Oklahoma State University ----------	6	0	0	0	0	0	1	3	0	0	0	1	1
Oregon State University ----------	14	0	1	2	0	3	2	3	2	0	0	1	0
The Pennsylvania State University --	8	0	3	3	0	0	0	0	1	0	0	1	0
University of Tennessee ----------	10	0	3	0	0	0	0	0	0	0	0	1	6
A & M College of Texas ----------	13	0	0	3	0	0	5	2	1	0	2	0	0
Virginia Polytechnic Institute -----	3	0	2	1	0	0	0	0	0	0	0	0	0
Washington State University --------	8	0	0	0	0	1	2	2	0	0	0	3	0
West Virginia University ----------	6	0	0	3	0	0	0	0	3	0	0	0	0
University of Wisconsin ----------	81	0	5	24	1	8	8	7	15	3	1	7	2

1/ Includes pre-medical, pre-dental, and pre-veterinary sciences.

3. Doctorates in Accounting and Other Business and Commerce Fields

The data on degrees awarded in business and commerce are shown in table 5; the high points are summarized briefly here.

Of the total of 137 doctorates awarded by all U.S. institutions, seven of the land-grant schools awarded 36, or 26 percent. Of these, the University of Illinois and Ohio State University together awarded 22, or 85 percent of the land-grant total. In accounting, the land-grant institutions awarded 61 percent, and in all other business and commerce fields, 21 percent of the total. The 26 percent is, of course, considerably less than the land-grant average of 38 percent of doctorates in all fields combined.

Table 5.--Doctorates in Accounting and Other Business and Commerce Fields Awarded by All Institutions, by All Land-Grant Institutions, and by Each Land-Grant Institution, by Field: Aggregate United States, 1958-59

Institution	Total business and commerce	Accounting	All other business and commerce fields
1	2	3	4
(Land-grant degrees as percent of those awarded by all institutions)---	26	61	21
Total degrees, all institutions------	137	18	119
Total degrees, land-grant institutions----------	36	11	25
University of California----------	3	0	3
University of Illinois----------	12	8	4
Louisiana State University----------	2	2	0
University of Maryland----------	1	0	1
University of Minnesota----------	1	0	1
Cornell University----------	1	0	1
The Ohio State University----------	10	1	9
University of Wisconsin----------	6	0	6

4. Doctorates in Education

In the field of education, as table 6 shows, 28 land-grant institutions awarded 503 doctoral degrees, or 32 percent of the total awarded by all U.S. institutions. The largest number of degrees awarded, by far, were in counseling and guidance, with 201 degrees, followed by "Education, general," with 123 degrees, and "other fields," with 51. The highest percentage of total degrees awarded was in agricultural education (100 percent), and the lowest, music education (6 percent). As for individual institutions, the largest numbers of degrees were awarded by the University of California (55), Ohio State (52), the University of Wisconsin (50), Illinois (38), Pennsylvania State (32) and Michigan State (29). Together, these six institutions awarded 256 doctorates, or 51 percent of the total; the top 10 institutions awarded 347 degrees, or 69 percent of the total. Six institutions awarded fewer than five degrees each; and an additional four institutions awarded between five and 10 degrees each.

A closer examination of the figures shows a very uneven distribution of degrees in the various fields. For example, in the largest field, counseling and guidance, 19 institutions awarded degrees; but in art education and the education of exceptional children, only one institution awarded degrees in each field; and in adult education and music education only two institutions awarded degrees in each. Considering the small number of institutions awarding degrees in these latter fields, there would seem to be a positive opportunity for the further development of doctoral work in these fields.

5. Doctorates in Home Economics

The data on doctoral degrees in home economics are presented in table 7. Historically, the land-grant institutions have conceived their educational role as closely related to instruction in home economics, along with agriculture and engineering. The data bear out this close relationship.

Nine of the land-grant institutions awarded a total of 17 doctorates in 1958-59--65 percent of all doctoral degrees in home economics awarded in the United States. In three fields, all of the degrees were awarded by land-grant institutions; in two others, land-grant institutions awarded at least 60 percent of all degrees; and in clothing and textiles, the remaining field, land-grant degrees were one-fifth of the U.S. total. Only one institution awarded one degree each in clothing and textiles and in institutional management; and only one institution awarded all of the degrees in child development and family relations. The reader's attention is called to the fact that doctoral degrees in home economics education were shown separately in table 6.

Table 6,-- Doctorates in Education Awarded by All Institutions, by All Land-Grant Institutions, and by Each Land-Grant Institution, by Field: Aggregate United States, 1958-59

Institution	Total, education	Adult education	Agricultural education	Art education	Business and commercial education	Counseling and guidance, etc.1/	Education of exceptional children2/	Education, general	Elementary education3/	Home economics education	Industrial arts education (non-vocational)	Industrial and trade education (vocational)	Music education	Physical education	Secondary education, etc.4/	Specialized teaching fields, other, etc.5/	Other fields6/
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
(Land-grant degrees as percent of those awarded by all institutions) -----	32	75	100	27	19	34	13	30	19	63	77	67	6	17	31	43	29
Total degrees, all institutions ----------	1,597	8	12	15	27	588	15	413	72	8	13	9	35	69	62	72	179
Total degrees, land-grant institutions ----------	503	6	12	4	5	201	2	123	14	5	10	6	2	12	19	31	51
Auburn University ----------	6	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0
University of Arizona ----------	3	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0
University of Arkansas ----------	9	0	0	0	0	5	0	0	1	0	0	1	0	0	2	0	0
University of California ----------	55	1	0	0	0	36	0	12	6	0	0	0	0	0	0	0	0
University of Connecticut --------	16	0	0	0	0	0	0	16	0	0	0	0	0	0	0	0	0
University of Florida ----------	10	0	0	0	1	3	0	6	0	0	0	0	0	0	0	0	0
University of Georgia ----------	2	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
University of Illinois ----------	38	0	0	0	0	33	0	0	0	0	0	0	1	4	0	0	0
Purdue University ----------	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	5
Iowa State University ----------	3	0	0	0	0	0	0	0	0	2	0	1	0	0	0	0	0
University of Kentucky ----------	12	0	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0
Louisiana State University -------	4	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0
University of Maryland ----------	22	0	0	0	0	7	0	0	2	0	0	2	0	1	1	0	9
Michigan State University --------	29	0	0	0	0	15	0	14	0	0	0	0	0	0	0	0	0
University of Minnesota ----------	16	0	0	0	0	0	0	15	0	0	0	0	0	0	0	0	1
University of Missouri ----------	24	0	1	0	0	6	2	1	0	0	7	0	0	2	1	4	0
University of Nebraska ----------	28	0	0	0	0	19	0	0	0	0	0	0	0	0	9	0	0
Rutgers, The State University ----	17	0	0	0	0	16	0	0	0	0	0	0	0	0	0	0	1
Cornell University ----------	15	5	1	0	0	6	0	0	0	1	0	2	0	0	0	0	0
The Ohio State University --------	52	0	5	0	0	2	0	0	0	0	1	0	0	3	0	6	35
Oklahoma State University --------	11	0	0	0	0	3	0	7	0	0	0	0	0	0	1	0	0
Oregon State University ----------	3	0	0	0	0	2	0	1	0	0	0	0	0	0	0	0	0
The Pennsylvania State University-	32	0	3	4	1	6	0	1	5	2	2	0	1	1	5	1	0
University of Tennessee ----------	14	0	0	0	0	14	0	0	0	0	0	0	0	0	0	0	0
Washington State University ------	9	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0
West Virginia University ----------	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0
University of Wisconsin ----------	50	0	0	0	0	0	0	32	0	0	0	0	0	0	0	18	0
University of Wyoming ----------	14	0	0	0	1	8	0	4	0	0	0	0	0	1	0	0	0

1/ Includes educational administration and supervision, finance, curriculum, comparative education, etc.

2/ Includes education of mentally retarded.

3/ Includes early childhood education.

4/ Includes combined elementary and secondary education.

5/ Includes speech correction.

6/ Includes education, not further classified; other non-teaching fields; health education and recreation; distributive education; and other general teaching fields.

Table 7.-- Doctorates in Home Economics Awarded by All Institutions, by All Land-Grant Institutions, and by Each Land-Grant Institution, by Field: Aggregate United States, 1958-59

(Data for Home Economics education are shown in Table 6, column 11)

Institution	Total, home economics	Child development and family relations	Clothing and textiles	Foods and nutrition	Home economics, general	Institutional management	Other specific fields (not further classified)
1	2	3	4	5	6	7	8
(Land-grant degrees as percent of those awarded by all institutions) ----	65	60	20	63	100	100	100
Total degrees, all institutions ----------	26	5	5	8	2	1	5
Total degrees, land-grant institutions ----------	17	3	1	5	2	1	5
University of California -------	1	0	0	1	0	0	0
Iowa State University ----------	2	0	0	0	0	1	1
Kansas State University --------	1	0	0	1	0	0	0
Michigan State University ------	2	0	0	2	0	0	0
University of Minnesota --------	1	0	0	0	0	0	1
Cornell University -------------	5	3	0	0	0	0	2
Ohio State University ----------	2	0	1	1	0	0	0
The Pennsylvania State University -------------------	1	0	0	0	1	0	0
University of Wisconsin --------	2	0	0	0	1	0	1

Both the small number of doctorates awarded, and the limited number of institutions awarding advanced degrees in home economics, prompt one to ask whether enough attention is being given to doctoral work in this field. Consider for a moment some of the specific fields involved in the general area: child development and family relations, foods and nutrition, and institutional management. In these three fields the land-grant institutions awarded only 14 doctor's degrees, and all U.S. institutions together awarded only 26. Consider also that the United States is a nation of over 185 million people, with an expected population, within a decade, of over 200 million. Our population is growing especially fast at the two age extremes--the very young and the elderly. We have recently witnessed a growing national concern with problems of juvenile delinquency, institutional care, diet and public health--all areas with which home economics education is closely concerned. Graduate education at the doctoral level is the customary route through which pass those qualified to teach others and to do research. Where, we may ask, are the qualified teachers coming from to train others, not only for further teaching, but for positions in research and administration in nonacademic positions? Twenty-six doctoral graduates a year is a very small force of educated talent indeed to cope with the problems of such a socially important field. Perhaps there is an opportunity here for those land-grant institutions already engaged in doctoral work, to expand their output considerably.

6. Doctorates in the Humanities

The land-grant contributions to doctoral-degree output in the humanities are shown in table 8. According to the table, 18 of the land-grant institutions awarded 189 doctoral degrees, or 19 percent of the U.S. total. The largest number of degrees were in English and journalism (83), followed, in order, by foreign languages and linguistics (48), speech and dramatic art (42), philosophy (12), music (3), and fine and applied arts (1).

The total of 189 doctoral degrees in the humanities may be compared with the totals in fields previously discussed: 349 in agriculture and forestry, 560 in the biological sciences, 503 in education, and much smaller numbers in business and commerce, and in home economics.

In the humanities, the University of Wisconsin awarded the largest number of degrees (37), followed by the University of California (32), and the University of Illinois (29). Together, these three institutions awarded over half of the land-grant doctorates. If one adds those conferred by the University of Minnesota (21), and Ohio State (16), he finds that these five universities awarded over 71 percent of all the land-grant degrees in the humanities. Of the 18 institutions awarding some degrees (out of 68 land-grant institutions), 11 awarded fewer than four each.

Table 8.-- Doctorates in the Humanities Awarded by All Institutions, by All Land-Grant Institutions, and by Each Land-Grant Institution, by Field: Aggregate United States, 1958-59

Institution	Total, humanities	Fine and applied arts1/	English and journalism	Foreign language and linguistics2/	Music	Philosophy	Speech and dramatic art
1	2	3	4	5	6	7	8
(Land-grant degrees as percent of those awarded by all institutions) ---	19	3	22	20	3	15	34
Total degrees, all institutions ----------	979	40	382	241	112	80	124
Total degrees, land-grant institutions ----------	189	1	83	48	3	12	42
University of Arkansas ---------	1	0	1	0	0	0	0
University of California -------	32	0	8	17	2	5	0
University of Florida ----------	11	0	9	0	0	0	2
University of Georgia ----------	1	0	1	0	0	0	0
University of Illinois ---------	29	0	12	7	0	1	9
University of Kentucky ---------	2	0	2	0	0	0	0
Louisiana State University -----	2	0	1	1	0	0	0
University of Maryland ---------	3	0	1	2	0	0	0
Michigan State University ------	3	0	1	0	1	1	0
University of Minnesota --------	21	0	10	3	0	2	6
University of Missouri ---------	9	0	6	1	0	0	2
University of Nebraska ---------	2	0	1	0	0	1	0
Rutgers, The State University --	3	0	3	0	0	0	0
Cornell University -------------	12	0	5	4	0	1	2
The Ohio State University ------	16	1	3	3	0	0	9
The Pennsylvania State University -------------------	3	0	0	1	0	0	2
University of Tennessee --------	2	0	2	0	0	0	0
University of Wisconsin --------	37	0	17	9	0	1	10

1/Includes art, general; other specific fields; and fine arts, not further classified.

2/Includes philology and literature of romance and Germanic languages and foreign language and literature not elsewhere classified.

As one would expect, the greatest number of institutions awarded degrees in English and journalism. Ten institutions awarded degrees in foreign languages and linguistics, eight awarded degrees in speech and dramatic art, seven in philosophy, two in music, and one in fine arts.

Persons familiar with the history of the land-grant institutions will recognize, in the figures just cited, the recurrence of a familiar problem: the uncertain place of the humanities in institutions founded, in the words of the Morrill Act "where the leading object shall be, without excluding other scientific and classical studies..., to teach such branches of learning as are related to agriculture and the mechanic arts...."

Much controversy has centered, from the beginning, around the proper interpretation of this passage in the founding Act, and much has centered also in the actual practice of the land-grant institutions. It may be remembered, to cite one example, that Daniel Coit Gilman left the presidency of the University of California, in 1874, in part because he could not agree with the pressure to stress the practical and vocational aspects of the curriculum, to the possible neglect of the basic arts and sciences.

To this problem of the proper place of the humanities in the land-grant institutions, at least two answers have been given. One is that suggested by Professor Whitney J. Oates in his address to the Land-Grant Centennial Convocation in Kansas City, in November, 1961. "If," said Professor Oates, "one accepts the point that the Humanities at their best entail the development of a reflective or philosophic attitude of mind, then in any institution where the Agricultural and Mechanic Arts are taught the presence of the Humanities could be supremely important by way of providing fundamental insights into the goals of these arts."[1/] It is interesting to note that this view was also expressed by another speaker at the same convocation, whose subject was graduate work in the natural sciences at the land-grant institutions. Dr. Detlev Bronk, president of the Rockefeller Institute and a distinguished biologist, said in one part of his address: "Now, at a time when science and its applications influence all phases of our culture, it is increasingly desirable that future scientists be reared in an atmosphere wherein the relations of science to art and literature and history and the social sciences be stressed. We need more scientists who are humanists."[2/]

[1/] From "The Study of the Humanities in the Graduate Schools of Land-Grant Colleges and State Universities" (mimeographed), by Whitney J. Oates, delivered Nov. 15, 1961, p. 5. Quoted with the permission of the Association of Land-Grant Colleges and State Universities.

[2/] Underlining by the authors of this report. From "Evaluation of Graduate Work in Natural Sciences at Land-Grant Institutions" (mimeographed), by Detlev Bronk, delivered Nov. 14, 1961, p. 11. Quoted with permission of the Association of Land-Grant Colleges and State Universities.

Another approach to the same problem results from a reappraisal of the land-grant institutions in the light of existing conditions 100 years after the founding Act. What seemed of primary importance in 1862 is still, no doubt, important, but may have assumed a lesser priority in the larger purposes of today's changed domestic and international environment. The Nation today evidently needs to make better use of all its personal and institutional resources for training and education at the most advanced levels. The land-grant institutions, because of their previous experience in graduate work are among the Nation's most important institutional resources. Therefore a considerable strengthening and expansion of their graduate programs in the humanities is in the best national interest. Of course, the decision to expand in any particular direction can be made only by the institutions themselves, in the light of their total capacities and objectives. But for the Nation to provide support for those which do wish to strengthen their programs is consistent both with existing realities and with the original policy of the Morrill Act. Such, at least, is the rationale which has been put forward by persons who believe that the humanities should be further strengthened in the land-grant institutions.

7. Doctorates in the Physical Sciences, Mathematics and Engineering

The data in table 9 show that in 1958-59, 40 of the 68 land-grant institutions awarded 1,220 doctor's degrees in these related fields, and that these were 44 percent of the total awarded by all U.S. institutions. This total of 1,220 degrees was over 2-1/2 times greater than the total in agriculture and forestry, over twice the number in the biological sciences and education, and over six times greater than the number awarded in the humanities. Clearly, the area is one of great strength in land-grant institutions.

Within the entire area, the fields in which the largest numbers of doctorates were awarded were, in declining order, chemistry (454), engineering (351), physics (184), mathematics and statistics (107), geology (74), earth sciences (27), and other physical sciences (15), and metallurgy (8). With the exception of other physical sciences, land-grant degrees were from 38 to 63 percent of all U.S. doctorates in each major field.

In total number of doctorates awarded, the Massachusetts Institute of Technology, with 189, heads the list, followed by the University of California (156), Illinois (133), Wisconsin (73), and Purdue (72). Together, these five awarded 623 doctorates, or 51 percent of the land-grant total. Adding in the doctorates from the next five institutions gives a total of 922 doctorates, or 76 percent of those awarded by all 40 institutions.

Table 9.-- Doctorates in the Physical Sciences, Mathematics and Engineering Awarded by All Institutions, by All Land-Grant Institutions, and by Each Land-Grant Institution, by Field: Aggregate United States, 1958-59

Institution	Total	Chemistry	Earth sciences[1]	Engineering	Geology	Mathematics and statistics	Metallurgy	Physics	Other physical sciences[2]
1	2	3	4	5	6	7	8	9	10
(Land-grant degrees as percent of those awarded by all institutions) -------	44	45	63	49	40	38	53	38	19
Total degrees, all institutions ----------	2,808	1,009	43	714	184	282	15	482	79
Total degrees, land-grant institutions ----------	1,220	454	27	351	74	107	8	184	15
Auburn University ----------	1	0	0	0	0	1	0	0	0
University of Arizona ----------	6	0	0	0	6	0	0	0	0
University of Arkansas ----------	3	3	0	0	0	0	0	0	0
University of California ----------	156	47	6	24	12	22	0	40	5
Colorado State University ----------	2	0	0	2	0	0	0	0	0
University of Connecticut ----------	10	8	0	0	0	0	0	2	0
University of Delaware ----------	15	12	0	3	0	0	0	0	0
University of Florida ----------	18	11	0	0	0	6	0	1	0
University of Georgia ----------	1	0	0	0	0	1	0	0	0
University of Hawaii ----------	2	2	0	0	0	0	0	0	0
University of Illinois ----------	133	51	0	45	14	11	0	12	0
Purdue University ----------	72	31	0	26	0	9	0	6	0
Iowa State University ----------	48	22	0	12	1	7	2	4	0
Kansas State University ----------	4	3	0	1	0	0	0	0	0
University of Kentucky ----------	8	8	0	0	0	0	0	0	0
Louisiana State University --------	19	2	0	3	4	4	0	6	0
University of Maryland ----------	33	15	0	4	0	2	2	10	0
Massachusetts Institute of Technology ----------	189	40	5	97	4	10	0	33	0
University of Massachusetts -------	3	3	0	0	0	0	0	0	0
Michigan State University ---------	39	15	0	15	1	3	0	5	0
University of Minnesota ----------	56	29	0	13	5	3	1	5	0
University of Missouri ----------	20	6	0	3	4	2	0	5	0
Montana State College ----------	7	4	0	3	0	0	0	0	0
University of Nebraska ----------	3	3	0	0	0	0	0	0	0
University of New Hampshire -------	5	5	0	0	0	0	0	0	0
Rutgers, The State University -----	15	8	0	0	3	0	0	4	0
Cornell University ----------	68	15	0	24	2	6	0	21	0
University of North Carolina State College of A & E ----------	10	0	0	4	0	6	0	0	0
The Ohio State University ---------	69	31	0	20	3	4	0	11	0
Oklahoma State University ---------	15	9	0	5	0	1	0	0	0
Oregon State University ----------	9	7	0	0	0	1	0	1	0
The Pennsylvania State University -	58	15	13	11	0	1	3	6	9
University of Tennessee ----------	16	10	0	1	1	2	0	2	0
A & M College of Texas ----------	13	6	3	1	1	0	0	2	0
Utah State University ----------	3	0	0	3	0	0	0	0	0
Virginia Polytechnic Institute ----	9	1	0	3	2	3	0	0	0
Washington State University -------	5	4	0	0	0	0	0	1	0
West Virginia University ----------	2	2	0	0	0	0	0	0	0
University of Wisconsin ----------	73	26	0	28	9	2	0	7	1
University of Wyoming ----------	2	0	0	0	2	0	0	0	0

1/ Includes geophysics, meteorology and oceanography, and other earth sciences.

2/ Includes astronomy; physical sciences, general; and physical sciences, not elsewhere classified.

8. Doctorates in the Social Sciences and Psychology

The details on the land-grant contribution to doctoral output in the social sciences and psychology are presented in table 10. The figures show that 25 of the land-grant institutions awarded a total of 531 doctor's degrees in these fields, or 31 percent of the national total. The largest numbers of degrees were awarded by the University of California (84), the University of Minnesota (80), the University of Wisconsin (58), and Ohio State University (50). Together these four institutions awarded 272 doctorates, or 51 percent of all land-grant degrees in these fields. Adding in the degrees for the next six institutions produces a total of 424 degrees, or 80 percent of the total conferred by 10 institutions.

In the various fields shown, the largest number of doctorates (241) was conferred in psychology, which accounts for over 45 percent of all degrees shown. Following psychology in the number of degrees awarded were history (82), sociology (73), economics (57), political science (41), geography (18), anthropology (12), area studies (4), international relations (2), and American civilization and culture (1). These degrees number 290 or 27 percent of the national total in the social sciences.

Those familiar with recent developments in the land-grant institutions know that many of them have been among the leaders of American institutions in the recent extensive involvement of the United States in training and educational programs in foreign countries. Thousands of foreign students have come to this country, and thousands of American students and teachers have gone abroad, partly to study, partly to teach. United States experts in fields ranging from agricultural extension to social work are heavily engaged in establishing foreign institutes for improved governmental and private administration and organization in finance, education, public health and police administration, to mention only a few of the more popular fields. Moreover, because of the historic orientation of the land-grant institutions toward problems of public policy, foreign countries have frequently looked to these institutions for models of their own development. It is true that many of these endeavors have involved the "professions," as distinguished from the basic academic disciplines. But all of the professions are involved because of decisions in the realm of public policy, and they are therefore heavily dependent upon the basic social sciences for their intellectual content and substance. One is therefore led to conclude that graduate work in the social sciences should be a major area of strength at the land-grant institutions. The facts cited earlier show, however, that although the land-grant institutions have done more for the social sciences than they have for the humanities, they still have a long way to go before they even approximate their concentration of strength in the natural science fields.

If further evidence on this point is needed, let the reader consider the following. Table 10 shows that of the 68 land-grant institutions, fewer than one-third (21, to be exact) awarded doctoral degrees in

Table 10.--Doctorates in the Social Sciences and Psychology Awarded by All Institutions, by All Land-Grant Institutions, and by Each Land-Grant Institution, by Field: Aggregate United States, 1958-59

Institution	Total	American civilization and culture	Anthropology	Area studies	Economics	Geography	History	International relations	Political science and government	Psychology	Sociology	Other social sciences and social sciences, general
1	2	3	4	5	6	7	8	9	10	11	12	13
(Land-grant degrees as percent of those awarded by all institutions)-----	31	6	22	15	26	35	25	7	22	38	47	0
Total degrees, all institutions ----------	1,727	18	55	26	221	51	324	29	191	635	157	20
Total degrees, land-grant institutions ----------	531	1	12	4	57	18	82	2	41	241	73	0
University of Arizona ----------	5	0	5	0	0	0	0	0	0	0	0	0
University of Arkansas ----------	1	0	0	0	1	0	0	0	0	0	0	0
University of California ---------	84	0	6	0	16	4	18	1	11	21	7	0
University of Connecticut --------	9	0	0	0	0	0	0	0	0	9	0	0
University of Florida ----------	13	0	0	1	1	1	2	0	0	4	4	0
University of Illinois ----------	44	0	0	0	7	3	9	0	6	12	7	0
Purdue University ----------	33	0	0	0	0	0	0	0	0	30	3	0
Iowa State University ----------	1	0	0	0	0	0	0	0	0	0	1	0
University of Kentucky ----------	20	0	0	0	0	0	2	0	1	14	3	0
Louisiana State University -------	17	0	0	0	0	2	2	0	0	8	5	0
University of Maryland ----------	9	1	0	0	0	0	0	0	3	4	1	0
University of Massachusetts ------	10	0	0	0	0	0	0	0	0	10	0	0
Michigan State University --------	12	0	0	0	2	0	0	0	0	6	4	0
University of Minnesota ----------	80	0	0	3	4	2	8	0	6	48	9	0
University of Missouri ----------	10	0	0	0	0	0	3	0	1	4	2	0
University of Nebraska ----------	12	0	0	0	2	1	4	0	0	5	0	0
Rutgers, The State University ----	7	0	0	0	1	0	0	0	4	2	0	0
Cornell University ----------	20	0	0	0	3	0	4	1	1	3	8	0
The Ohio State University --------	50	0	1	0	6	1	9	0	3	23	7	0
Oklahoma State University --------	1	0	0	0	0	0	0	0	0	1	0	0
The Pennsylvania State University-	18	0	0	0	0	0	0	0	1	12	5	0
University of Tennessee ----------	11	0	0	0	0	0	0	0	0	11	0	0
Washington State University ------	5	0	0	0	0	0	0	0	0	3	2	0
West Virginia University ---------	1	0	0	0	0	0	1	0	0	0	0	0
University of Wisconsin ----------	58	0	0	0	14	4	20	0	4	11	5	0

psychology, only 16 institutions awarded degrees in sociology, only 12 in history, 11 in political science, 8 in geography, 3 in anthropology, 2 each in area studies and international relations, and 1 in American civilization and culture!

It must have been a consideration of some such facts as these which led another speaker at the Land-Grant Convocation to say: "[the social sciences] may represent, for the land-grant institutions, the same challenge that the sciences represented 100 years ago--the challenge of a growing set of subjects of great importance for the human welfare, and appropriate for development at a range of graduate schools that have not yet approached their maximum size. Without doubt, the twentieth century will be known, among other things, for the development of the social sciences in this country...this means that they [i.e., the land-grant institutions] should stress their programs in the social sciences, develop them, enlarge them, improve them."9/

9. Doctorates in Applied Social Sciences

Included in the applied social sciences shown on table 11 are agricultural economics, industrial relations, public administration, social work, social administration, and a number of miscellaneous other fields. In these subjects the land-grant institutions awarded 78 doctor's degrees, or 65 percent of the national total.

As one would expect, the largest number of degrees (66) was awarded in agricultural economics, with 96 percent of the national total. One institution, Cornell, awarded all of the land-grant, and all of the Nation's degrees in industrial relations. Cornell also was the only land-grant institution awarding degrees in public administration--17 percent of the national total. And two universities, Minnesota and Ohio State, awarded all of the land-grant degrees in social work and social administration--again, 17 percent of the national total.

The reasons which led us to support an enlargement of land-grant programs in the basic social sciences apply equally to the situation in the applied social sciences. Evidently, the land-grant institutions, compared with all other U.S. institutions, have not neglected these fields. But, compared with what they have done in the physical and biological sciences, their efforts in these fields seem rather limited. With wider opportunities beckoning, both at home and abroad, we can only hope that more students will seek advanced training in these fields, and that the land-grant institutions, with others, will do their best to provide the necessary educational opportunities.

9/ From "An Evaluation of Graduate Work in the Social Sciences in the Land-Grant Institutions," (mimeographed), by Bernard Berelson. Nov. 13, 1961, p. 17. Quoted with permission of the Land-Grant Association.

Table 11.--Doctorates in Applied Social Sciences Awarded by All Institutions, by All Land-Grant Institutions, and by Each Land-Grant Institution, by Field: Aggregate United States, 1958-59

Institution	Total, applied social sciences	Agricultural economics	Industrial relations	Public administration	Social work, social administration	Applied social sciences, all other
1	2	3	4	5	6	7
(Land-grant degrees as percent of those awarded by all institutions) ----	65	96	100	17	17	0
Total degrees, all institutions ----------	121	69	4	18	30	0
Total degrees, land-grant institutions ----------	78	66	4	3	5	0
University of California ----------	5	5	0	0	0	0
University of Florida ----------	1	1	0	0	0	0
University of Illinois ----------	4	4	0	0	0	0
Purdue University ----------	10	10	0	0	0	0
Iowa State University ----------	13	13	0	0	0	0
Michigan State University ----------	5	5	0	0	0	0
University of Minnesota ----------	6	2	0	0	4	0
University of Missouri ----------	3	3	0	0	0	0
Cornell University ----------	11	4	4	3	0	0
University of North Carolina State College of A & E ----------	2	2	0	0	0	0
The Ohio State University ----------	5	4	0	0	1	0
Oklahoma State University ----------	1	1	0	0	0	0
Oregon State University ----------	1	1	0	0	0	0
The Pennsylvania State University --	1	1	0	0	0	0
South Dakota State College ----------	1	1	0	0	0	0
University of Wisconsin ----------	9	9	0	0	0	0

10. Doctorates in General Programs and Miscellaneous Fields

Table 12 presents the data for a number of degrees which have been classified by the Office of Education as "general" programs (i.e., without specific majors) in arts and sciences, and in certain other areas not elsewhere classified.

Briefly, the table shows that three land-grant institutions awarded 11 doctorates in these fields, or 39 percent of the national total. The number of degrees is so small that it is difficult to assess their true importance, but they are included only to show the number of all degrees awarded, in whatever field.

Table 12.--Doctorates in General Programs and Miscellaneous Fields Awarded by All Institutions, by All Land-Grant Institutions, and by Each Land-Grant Institution, by Field: Aggregate United States, 1958-59

Institutions	Total	Arts, general program	Sciences, general program	Arts and sciences, general program	Miscellaneous 1/ fields
1	2	3	4	5	6
(Land-grant degrees as percent of those awarded by all institutions) ----	39	0	50	100	37
Total degrees, all institutions ----------	28	2	6	1	19
Total degrees, land-grant institutions ----------	11	0	3	1	7
University of Florida ----	3	0	3	0	0
University of Illinois ---	5	0	0	0	5
University of Wisconsin --	3	0	0	1	2

1/ These degrees are classified in the Earned Degrees study under "Major Fields of Study Not Elsewhere Classified," pp. 184-5.

Part II--Master's Level Degrees Awarded by Land-Grant Institutions in 1958-59

1. Master's-Level Degrees in Agriculture and Forestry

Fifty of the 68 land-grant institutions, as shown in table 13, awarded 1,099 master's-level degrees in agriculture and forestry, or 93 percent of the national total. Only in forestry were the land-grant degrees as few as 65 percent of the total; in all other fields, the land-grant contribution was 93 percent or more.

The five universities awarding the largest numbers of degrees were, in descending order, Michigan State (90), the University of California (59), the University of Missouri (52), Cornell (47), and the University of Illinois (45). Together these five institutions awarded 293, or 27 percent of all land-grant master's-level degrees. The 12 institutions awarding the largest numbers of degrees conferred 547, or 50 percent of the total.

The leading fields, in the number of degrees awarded were agronomy (271), animal husbandry (181), horticulture (124), forestry (110), and general agriculture (102). In six other fields the number of degrees ranged from 82, in soils, to 10 in farm management.

The figure of 93 percent of all master's-level degrees in agriculture and forestry, awarded by the land-grant institutions, compares with 93 percent of all doctor's degrees in the same fields, and with 25 percent of the master's-level degrees awarded by land-grant institutions in all fields combined. Clearly, the land-grant institutions almost completely dominate graduate work in agriculture.

2. Master's-Level Degrees in the Biological Sciences

The data on master's-level degrees in the biological sciences, shown in table 14, reveal that 53 of the 68 land-grant institutions awarded 930 degrees, or 47 percent of the national total. This 47 percent of the master's-level degrees compares with 25 percent of such degrees in all fields combined, and with 54 percent of all doctor's degrees in the biological sciences.

The table shows that the most popular fields, in number of degrees awarded, were zoology (191), entomology (131), bacteriology, virology, mycology and parasitology (122), botany (93), biology, general (77), pathology and plant pathology (70), biochemistry and biophysics (68), physiology and plant physiology (49), genetics (30), anatomy and histology (28), pharmacology (10), and all other biological fields combined (55).

The institutions awarding the largest numbers of degrees were, in declining order, the Universities of Illinois and Wisconsin (81 each), the University of California (78), the University of Minnesota (46), and

Table 13.--Master's-Level Degrees in Agriculture and Forestry Awarded by All Institutions, by All Land-Grant Institutions, and by Each Land-Grant Institution, by Field: Aggregate United States, 1958-59

Institution	Total, agriculture and forestry	Agronomy	Animal husbandry	Dairy husbandry	Dairy manufacturing and technology	Farm management	Food technology	Forestry	Horticulture, plain and ornamental	Poultry husbandry	Soils	Agriculture, general, etc.1/
1	2	3	4	5	6	7	8	9	10	11	12	13
(Land-grant degrees as percent of those awarded by all institutions) -----	93	99	94	100	100	100	100	65	99	100	99	94
Total degrees, all institutions ----------	1,183	275	193	76	52	10	33	169	125	58	83	109
Total degrees, land-grant institutions ----------	1,099	271	181	76	52	10	33	110	124	58	82	102
Auburn University ----------	7	1	4	0	0	0	0	0	1	1	0	0
University of Arizona ----------	18	7	2	0	0	0	0	0	3	1	5	0
University of Arkansas ----------	11	1	6	2	0	0	0	0	0	1	0	1
University of California ----------	59	10	2	0	0	0	0	14	22	3	1	7
Colorado State University --------	33	2	5	0	0	0	7	12	2	0	5	0
University of Connecticut --------	9	3	0	0	0	0	0	0	3	2	0	1
University of Delaware ----------	6	1	4	0	0	0	0	0	1	0	0	0
University of Florida ----------	18	2	8	0	2	0	0	0	2	0	2	2
University of Georgia ----------	15	3	1	2	0	0	4	3	1	1	0	0
University of Hawaii ----------	2	0	1	0	0	0	0	0	0	0	1	0
University of Idaho ----------	21	4	0	1	0	0	0	12	1	1	2	0
University of Illinois ----------	45	21	5	0	13	0	3	0	3	0	0	0
Purdue University ----------	33	12	4	3	0	0	0	1	8	5	0	0
Iowa State University ----------	32	14	7	0	3	0	0	3	0	4	0	1
Kansas State University ----------	35	17	8	3	0	0	0	0	2	2	0	3
University of Kentucky ----------	35	13	8	0	2	0	0	0	1	1	0	10
Louisiana State University ------	26	9	7	0	2	0	0	6	1	1	0	0
University of Maine ----------	6	3	0	0	0	0	0	3	0	0	0	0
University of Maryland ----------	19	5	2	4	0	0	1	0	4	1	1	1
University of Massachusetts ------	18	1	1	2	0	0	8	4	1	1	0	0
Michigan State University --------	90	4	2	0	12	0	1	8	20	2	8	33
University of Minnesota ----------	39	3	5	9	0	0	0	9	3	2	8	0
Mississippi State University -----	12	6	2	0	0	0	0	0	1	3	0	0
University of Missouri ----------	52	2	18	11	0	0	0	2	0	3	4	12
Montana State College ----------	10	1	3	0	1	0	0	0	0	0	2	3
University of Nebraska ----------	21	16	4	0	0	0	0	0	1	0	0	0
University of Nevada ----------	1	1	0	0	0	0	0	0	0	0	0	0
University of New Hampshire ------	4	0	0	0	0	0	0	0	0	4	0	0
Rutgers, The State University ----	27	4	3	2	0	0	2	0	8	2	1	5
New Mexico State University, A, E, & S ----------	2	0	2	0	0	0	0	0	0	0	0	0
Cornell University ----------	47	6	7	2	3	6	0	0	11	1	10	1
University of North Carolina State College of A & E ----------	20	1	7	0	0	0	0	6	0	1	1	4
North Dakota State University ----	2	2	0	0	0	0	0	0	0	0	0	0
The Ohio State University --------	26	11	6	4	3	0	0	0	2	0	0	0
Oklahoma State University --------	37	16	7	5	0	0	0	0	1	1	7	0
Oregon State University ----------	33	5	3	0	0	0	3	7	0	0	5	10
The Pennsylvania State University-	30	6	0	0	7	0	0	11	4	2	0	0
University of Rhode Island -------	3	1	1	0	0	0	0	0	1	0	0	0
Clemson Agricultural College -----	5	2	1	2	0	0	0	0	0	0	0	0
South Dakota State College -------	12	6	2	1	1	0	0	0	1	1	0	0
Tennessee A & I State University -	3	1	1	0	0	0	0	0	0	1	0	0
University of Tennessee ----------	25	8	8	2	0	0	0	0	3	3	0	1
A & M College of Texas ----------	30	12	3	2	0	0	0	0	4	4	1	4
Utah State University ----------	38	10	5	2	1	0	0	9	3	1	6	1
University of Vermont ----------	4	0	0	4	0	0	0	0	0	0	0	0
Virginia Polytechnic Institute ---	10	0	4	0	1	0	3	0	2	0	0	0
Washington State University ------	18	3	5	7	0	0	1	0	0	1	1	0
West Virginia University ----------	6	1	1	0	0	0	0	0	1	1	0	2
University of Wisconsin ----------	29	7	2	6	1	0	0	0	2	0	11	0
University of Wyoming ----------	15	7	4	0	0	4	0	0	0	0	0	0

1/ Includes agriculture, not further classified, and agriculture, other specific fields.

Table 14.--Master's Level Degrees in the Biological Sciences Awarded by All Institutions, by All Land-Grant Institutions, and by Each Land-Grant Institution, by Field: Aggregate United States, 1958-59

Institution	Total, biological sciences	Anatomy and histology	Bacteriology, virology mycology, and parasitology	Biochemistry and biophysics	Biology, general	Botany, general	Entomology	Genetics	Pathology and plant pathology	Pharmacology	Physiology and plant physiology	Zoology	All other biological sciences1/
1	2	3	4	5	6	7	8	9	10	11	12	13	14
(Land-grant degrees as percent of those awarded by all institutions) ----	47	48	60	56	14	53	96	86	84	30	48	52	38
Total degrees, all institutions ----------	2,002	59	204	121	537	177	136	35	83	33	102	370	145
Total degrees, land-grant institutions ----------	930	28	122	68	77	93	131	30	70	10	49	191	55
Auburn University ----------	10	0	0	0	0	2	6	0	0	0	0	1	1
University of Alabama ----------	2	0	0	0	0	0	0	0	0	0	0	0	2
University of Arizona ----------	13	0	0	2	2	3	1	0	1	0	0	2	2
University of Arkansas ----------	11	0	1	2	0	0	3	0	1	0	0	4	0
University of California ----------	78	10	11	4	2	4	6	2	4	2	3	26	4
Colorado State University ---------	29	1	1	0	11	2	0	2	6	0	2	4	0
University of Connecticut ---------	9	0	5	0	0	1	0	0	1	0	0	2	0
University of Delaware ----------	5	0	0	0	0	0	2	0	3	0	0	0	0
University of Florida ----------	6	0	0	0	1	0	4	0	1	0	0	0	0
University of Georgia ----------	8	0	3	0	0	0	0	0	2	0	0	3	0
University of Hawaii ----------	4	0	1	0	0	2	0	0	0	0	0	1	0
University of Idaho ----------	4	0	0	0	0	1	0	0	2	0	0	1	0
University of Illinois ----------	81	8	5	2	7	8	8	0	5	3	20	11	4
Purdue University ----------	40	0	0	7	21	6	6	0	0	0	0	0	0
Iowa State University ----------	24	0	0	0	0	4	11	1	0	0	0	8	0
Kansas State University ----------	25	0	5	0	0	0	11	0	3	0	0	6	0
University of Kentucky ----------	9	0	4	0	0	0	0	0	0	0	1	4	0
Louisiana State University --------	14	0	0	2	1	0	3	0	2	0	1	5	0
University of Maine ----------	9	0	0	2	0	0	0	0	0	0	0	7	0
University of Maryland ----------	24	0	7	0	0	2	2	0	3	1	3	6	0
Massachusetts Institute of Technology ----------	11	0	0	0	3	0	0	0	0	0	0	0	8
University of Massachusetts -------	12	0	5	0	0	1	4	0	0	0	0	2	0
Michigan State University ---------	34	1	7	0	5	6	3	0	0	0	5	7	0
University of Minnesota ----------	46	0	1	5	0	5	6	6	13	0	1	5	4
Mississippi State University ------	6	0	0	0	0	0	6	0	0	0	0	0	0
University of Missouri ----------	14	1	2	2	0	1	3	0	0	0	0	5	0
Montana State College ----------	8	0	0	0	1	1	0	0	0	0	0	1	5
University of Nebraska ----------	9	0	4	0	0	3	0	0	0	0	1	1	0
University of New Hampshire -------	7	0	0	1	0	1	0	0	0	0	0	5	0
Rutgers, The State University ----	24	0	6	2	0	1	3	0	0	2	3	5	2
New Mexico State University, A, E, & S ----------	1	0	0	0	1	0	0	0	0	0	0	0	0
Cornell University ----------	43	1	3	7	2	3	5	7	7	0	2	2	4
University of North Carolina State College of A & E ----------	7	0	0	0	0	0	3	0	1	0	0	0	3
North Dakota State University ----	7	0	1	0	1	2	3	0	0	0	0	0	0
The Ohio State University ---------	40	5	13	3	0	6	6	0	0	0	1	6	0
Oklahoma State University ---------	12	0	1	0	0	4	1	0	0	0	1	5	0
Oregon State University ----------	21	0	6	1	0	2	4	0	2	1	1	4	0
The Pennsylvania State University-	29	0	2	6	10	1	1	2	0	0	0	7	0
University of Rhode Island --------	7	0	0	0	1	0	0	0	0	0	0	3	3
Clemson Agricultural College ------	10	0	0	0	0	0	3	0	3	0	0	4	0
South Dakota State College --------	6	0	3	2	0	0	0	0	0	0	0	0	1
Tennessee A & I State University -	4	0	0	0	0	0	0	0	0	0	0	4	0
University of Tennessee ----------	12	0	2	0	2	3	1	0	0	0	0	4	0
A & M College of Texas ----------	13	0	0	2	0	0	6	2	1	0	1	1	0
Prairie View A & M College --------	1	0	0	0	1	0	0	0	0	0	0	0	0
Utah State University ----------	8	0	1	0	0	1	0	0	0	0	2	3	1
University of Vermont ----------	6	1	1	0	0	4	0	0	0	0	0	0	0
Virginia Polytechnic Institute ---	13	0	4	3	0	0	2	0	2	0	0	1	1
Virginia State College ----------	2	0	0	0	2	0	0	0	0	0	0	0	0
Washington State University -------	10	0	1	0	1	0	2	0	2	0	0	1	3
West Virginia University ---------	15	0	1	1	2	0	0	1	4	1	0	5	0
University of Wisconsin ----------	81	0	15	12	0	12	6	7	7	0	1	15	6
University of Wyoming ----------	6	0	0	0	0	1	0	0	0	0	0	4	1

1/ Includes pre-medical, pre-dental, and pre-veterinary sciences.

Cornell (43). Together, these five institutions awarded 329, or 35 percent of all master's-level degrees. If the degrees from the next four universities are added, then nine institutions awarded 472 degrees, or 51 percent of all the land-grant degrees in this area.

In individual fields the land-grant degrees ranged from 96 percent of the national total, in entomology, to a low of 14 percent in general biology--no doubt a reflection of the fact that general biology has been superseded, even at the master's-level, by more highly specialized fields. In both genetics and pathology the land-grant percentage is about 85, and it approaches or exceeds 50 percent in anatomy and histology, bacteriology and related fields, biochemistry and biophysics, botany, genetics, pathology, physiology and zoology. At the master's-level, as at the doctor's these figures clearly reveal the great strength of the land-grant institutions in the biological sciences.

3. Master's-Level Degrees in Business and Commerce

Land-grant degrees in the various business and commerce fields, shown in table 15, totalled 796, or 18 percent of the national total. This is, of course, below the average of 25 percent of land-grant master's-level degrees in all fields combined, and also below the 26 percent of all doctor's degrees awarded by the land-grant institutions in business and commerce.

The table shows that 35 of the 68 land-grant institutions awarded degrees in 1958-59. The largest numbers of degrees awarded were in "all other" business and commerce fields (698), followed by accounting (85), and with a handful each in hotel and restaurant administration and secretarial studies.

The four universities which together awarded about 52 percent of all degrees were, in descending order, the University of California (168), Michigan State University (104), Rutgers (90), and the University of Wisconsin (55). The 10 largest (in terms of degrees) universities awarded 591 degrees, or 74 percent of the land-grant total. Ten of the 35 institutions listed each awarded a total of five or fewer degrees. Only one university in hotel and restaurant administration (Michigan State), and one in secretarial studies (University of Georgia) accounted for all of the land-grant degrees in these two fields.

4. Master's-Level Degrees in Education

The number and percent of master's-level degrees conferred by the land-grant institutions in education are shown in table 16. The figures show that 58 of the land-grant institutions conferred 6,093 degrees, or 19 percent of the national total. This is below the average of 25 percent of land-grant master's in all fields, and is also considerably less

Table 15.--Master's-Level Degrees in Accounting and Other Business and Commerce Fields Awarded by All Institutions, by All Land-Grant Institutions, and by Each Land-Grant Institution, by Field: Aggregate United States, 1958-59

Institution	Total, business and commerce	Accounting	Hotel and restaurant administration	Secretarial studies	All other business and commerce fields
1	2	3	4	5	6
(Land-grant degrees as percent of those awarded by all institutions) ------	18	18	70	75	18
Total degrees, all institutions ----------	4,436	472	10	8	3,946
Total degrees, land-grant institutions ----------	796	85	7	6	698
Auburn University ----------	1	1	0	0	0
University of Arizona ----------	23	0	0	0	23
University of Arkansas ----------	28	2	0	0	26
University of California ----------	168	0	0	0	168
University of Connecticut ----------	16	0	0	0	16
University of Delaware ----------	5	0	0	0	5
University of Florida ----------	11	4	0	0	7
University of Georgia ----------	23	6	0	6	11
University of Hawaii ----------	3	0	0	0	3
University of Illinois ----------	28	12	0	0	16
Kansas State University ----------	1	0	0	0	1
University of Kentucky ----------	12	0	0	0	12
Louisiana State University ----------	19	10	0	0	9
University of Maine ----------	1	0	0	0	1
University of Maryland ----------	20	1	0	0	19
University of Massachusetts ----------	17	0	0	0	17
Michigan State University ----------	104	21	7	0	76
University of Minnesota ----------	19	0	0	0	19
Mississippi State University ----------	6	0	0	0	6
University of Missouri ----------	21	6	0	0	15
University of Nebraska ----------	10	0	0	0	10
Rutgers, The State University ----------	90	0	0	0	90
Cornell University ----------	7	0	0	0	7
The Ohio State University ----------	51	3	0	0	48
Oklahoma State University ----------	12	10	0	0	2
The Pennsylvania State University ----------	5	0	0	0	5
University of Rhode Island ----------	1	0	0	0	1
Tennessee A & I State University ----------	1	0	0	0	1
University of Tennessee ----------	14	0	0	0	14
A & M College of Texas ----------	7	3	0	0	4
Virginia Polytechnic Institute ----------	1	0	0	0	1
Washington State University ----------	3	0	0	0	3
West Virginia University ----------	1	0	0	0	1
University of Wisconsin ----------	55	5	0	0	50
University of Wyoming ----------	12	1	0	0	11

Table 16.--Master's-Level Degrees in Education Awarded by All Institutions, by All Land-Grant Institutions, and by Each Land-Grant Institution, by Field: Aggregate United States, 1958-59

Institution	Total, education	Adult education	Agricultural education	Art education	Business and commercial education	Counseling and guidance, etc.1/	Education of exceptional children2/	Education, general	Elementary education3/	Health and recreation education	Home economics education	Industrial arts education (non-vocational)	Industrial and trade education (vocational)	Music education	Physical education	Secondary education, etc.4/	Specialized teaching fields, other, etc.5/	Other fields6/
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
(Land-grant degrees as percent of those awarded by all institutions) -----	19	90	74	16	17	22	10	13	13	15	42	19	63	18	29	21	16	29
Total degrees, all institutions ----------	31359	57	380	321	636	7889	423	6875	5912	170	370	559	139	1011	1659	2386	1036	1536
Total degrees, land-grant institutions ----------	6093	51	282	50	108	1748	41	913	762	26	154	106	88	177	479	501	164	443
Auburn University ----------	143	0	25	0	0	81	0	0	26	0	0	0	0	2	9	0	0	0
University of Alabama ----------	16	0	0	0	0	0	0	16	0	0	0	0	0	0	0	0	0	0
University of Arizona ----------	87	0	3	0	1	28	4	0	26	0	3	0	0	6	1	14	1	0
University of Arkansas ----------	171	0	0	0	0	36	0	0	50	0	0	0	25	3	19	38	0	0
University of California ----------	205	0	0	0	0	77	0	71	0	5	0	0	0	0	52	0	0	0
Colorado State University ----------	74	0	21	0	0	10	5	0	0	0	12	18	3	0	5	0	0	0
University of Connecticut ----------	143	0	1	0	6	13	0	0	65	0	9	0	1	3	0	23	22	0
University of Delaware ----------	42	0	1	0	0	11	0	0	18	0	0	0	0	1	0	11	0	0
Florida A & M University ----------	147	0	0	0	0	0	0	147	0	0	0	0	0	0	0	0	0	0
University of Florida ----------	192	0	4	0	0	68	0	11	43	0	0	8	0	0	11	47	0	0
Fort Valley State College ----------	2	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
University of Georgia ----------	105	0	13	1	3	25	1	4	23	0	6	1	0	3	10	10	5	0
University of Hawaii ----------	9	0	0	1	0	8	0	0	0	0	0	0	0	0	0	0	0	0
University of Idaho ----------	66	0	2	0	2	0	0	0	0	0	0	0	0	5	0	0	0	57
University of Illinois ----------	473	0	5	5	0	334	5	0	0	13	4	0	0	61	38	6	2	0
Purdue University ----------	93	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	14	73
Iowa State University ----------	25	0	6	0	0	0	0	0	0	0	7	0	12	0	0	0	0	0
Kansas State University ----------	17	0	3	0	0	8	0	0	0	0	0	1	0	0	3	0	1	1
University of Kentucky ----------	164	0	11	0	10	59	0	0	25	0	26	0	0	3	5	21	4	0
Louisiana State University ----------	133	0	7	1	4	31	0	0	28	0	0	10	11	12	28	0	1	0
University of Maine ----------	96	0	0	0	0	37	1	0	30	0	2	3	0	0	7	16	0	0
University of Maryland ----------	125	2	0	0	3	44	0	1	13	1	1	2	5	2	8	3	2	38
University of Massachusetts ----------	35	0	0	0	0	0	0	3	10	0	0	0	0	0	1	21	0	0
Michigan State University ----------	334	1	9	0	10	162	5	103	0	1	8	7	0	7	21	0	0	0
University of Minnesota ----------	222	0	6	7	0	0	0	49	4	5	4	11	0	7	23	1	11	94
Mississippi State University ----------	64	0	9	0	0	21	0	0	23	0	1	0	4	0	0	6	0	0
Lincoln University ----------	5	0	0	0	0	0	0	0	2	0	0	0	0	0	0	3	0	0
University of Missouri ----------	155	0	9	0	1	43	0	0	32	0	2	7	0	12	21	23	5	0
Montana State College ----------	32	0	3	2	0	0	0	23	0	0	4	0	0	0	0	0	0	0
University of Nebraska ----------	141	0	6	0	0	63	0	0	27	0	1	0	0	19	2	23	0	0
University of Nevada ----------	18	0	0	0	0	14	0	0	1	0	0	0	0	0	0	2	0	1
University of New Hampshire ----------	12	0	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0
Rutgers, The State University ----------	249	0	4	0	0	134	0	1	48	0	2	0	0	4	23	11	0	22
New Mexico State University, A, E, & S ----------	31	0	2	0	0	12	0	7	8	0	2	0	0	0	0	0	0	0
Cornell University ----------	64	24	6	0	0	10	0	0	10	0	7	0	1	0	0	1	4	1
A & T College of North Carolina ---	118	0	7	0	0	0	0	1	0	0	0	0	4	0	0	106	0	0
University of North Carolina State College of A & E ----------	14	0	8	0	0	5	0	0	0	0	0	1	0	0	0	0	0	0
North Dakota State University -----	12	0	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0
The Ohio State University ----------	184	0	7	0	0	0	0	0	0	0	1	0	0	0	15	0	5	156
Oklahoma State University ----------	195	23	29	0	16	17	0	0	33	0	13	10	7	0	8	39	0	0
Oregon State University ----------	104	0	6	0	14	6	0	57	0	0	2	14	0	0	5	0	0	0
The Pennsylvania State University -	308	0	12	18	10	105	0	0	75	0	3	2	2	14	15	36	16	0
University of Rhode Island ---------	8	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0
Clemson Agricultural College ------	9	0	4	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0
South Carolina State College ------	113	0	0	0	0	0	0	113	0	0	0	0	0	0	0	0	0	0
South Dakota State College ---------	55	0	9	0	0	0	0	31	0	0	3	0	0	0	12	0	0	0
Tennessee A & I State University --	68	0	2	0	3	19	3	0	31	1	2	1	0	0	1	3	2	0
University of Tennessee ----------	114	0	10	0	8	43	7	0	12	0	3	0	3	2	24	0	2	0
A & M College of Texas ----------	33	0	14	0	0	0	0	0	0	0	0	0	8	0	0	0	11	0
Prairie View A & M College --------	127	0	5	0	1	23	6	0	67	0	5	2	0	3	7	8	0	0
Utah State University ----------	58	0	1	0	0	2	0	30	5	0	2	6	2	0	7	3	0	0
University of Vermont ----------	17	0	0	0	0	3	0	0	5	0	0	0	0	0	0	9	0	0
Virginia Polytechnic Institute ----	33	0	2	0	8	0	0	18	0	0	5	0	0	0	0	0	0	0
Virginia State College ----------	14	0	3	0	0	3	4	0	1	0	0	0	0	0	0	3	0	0
Washington State University --------	43	0	0	0	0	0	0	22	0	0	4	0	0	2	15	0	0	0
West Virginia University ----------	184	0	2	0	0	144	0	0	0	0	10	0	0	0	28	0	0	0
University of Wisconsin ----------	331	0	5	15	8	0	0	192	9	0	0	0	0	6	40	0	56	0
University of Wyoming ----------	61	1	0	0	0	25	0	0	10	0	0	2	0	0	9	14	0	0

1/ Includes educational administration and supervision, finance, curriculum, comparative education, etc.
2/ Includes education of mentally retarded. 3/ Includes early childhood education.
4/ Includes combined elementary and secondary education. 5/ Includes speech correction.
6/ Includes education, not further classified; other non-teaching fields; and other general teaching fields.

than the 32 percent of land-grant doctor's degrees in education.

The fields in which the largest number of degrees were awarded were counseling and guidance, administration, supervision, etc. (1,748), education, general (913), elementary education (762), secondary education (501), and physical education (479). The smallest numbers of degrees were granted in health and recreation education (26), education of exceptional children (41), art education (50), and adult education (51)--all fields in which it seems likely that there will be a rapidly expanding national need for larger numbers of well-trained teachers.

The institutions awarding the largest numbers of degrees were, in declining order, the University of Illinois (473), Michigan State (334), the University of Wisconsin (331), Pennsylvania State (308), and Rutgers (249). Together, these five institutions awarded 1,695 degrees, or 28 percent of the land-grant total.

The 12 institutions awarding the largest number of degrees (3,048) conferred 50 percent of the land-grant total.

We have already noted several fields in which the number of degrees awarded was relatively small. A further examination of the table also shows that in these fields only a few institutions awarded the majority of the degrees. For example, in art education, 33 out of a total of 50 degrees were awarded by two institutions; in the education of exceptional children half of all the degrees were awarded by four institutions; in adult education two institutions awarded 47 of the 51 degrees, and the three other institutions awarded four degrees; and, finally, in music education five institutions awarded 118 out of 177 degrees. In these fields a very few institutions appear to be doing the great bulk of the land-grant graduate work at the master's level.

Land-grant degrees were over 50 percent of the national total in adult education (90 percent), agricultural education (74 percent), and in industrial and trade (vocational) education (63 percent). They were 42 percent of the national total in home economics education, 29 percent of the total in physical education, and more than 20 percent each in secondary education, and in counseling, guidance, administration, etc.

The land-grant institutions which award approximately one-fifth of all degrees in education, obviously constitute an important national resource for public education at all levels.

5. Master's-Level Degrees in Home Economics

The relevant data on home economics degrees are shown in table 17. As the figures show, 36 of the land-grant institutions awarded 344 master's-level degrees, or 68 percent of the national total. We should add that table 16, commented upon in the preceding section, showed that 154 master's-level degrees were awarded in home economics education, and that these were

Table 17.--Master's-Level Degrees in Home Economics Awarded by All Institutions, by All Land-Grant Institutions, and by Each Land-Grant Institution, by Field: Aggregate United States, 1958-59
(Data for Home Economics education are shown in Table 16, column 12)

Institution	Total, home economics	Child development and family relations	Clothing and textiles	Foods and nutrition	Home economics, general	Institutional management	Other specific fields (not further classified)
1	2	3	4	5	6	7	8
(Land-grant degrees as percent of those awarded by all institutions) -----	68	66	74	56	63	79	84
Total degrees, all institutions ----------	507	71	57	79	188	19	93
Total degrees, land-grant institutions ----------	344	47	42	44	118	15	78
Auburn University ----------	8	0	2	1	0	0	5
University of Arkansas ----------	10	0	0	0	10	0	0
University of California ----------	15	5	0	4	6	0	0
Colorado State University ----------	11	0	4	0	7	0	0
University of Connecticut ----------	2	0	0	0	2	0	0
University of Georgia ----------	5	2	0	0	3	0	0
University of Idaho ----------	1	0	0	0	0	0	1
University of Illinois ----------	10	0	0	0	10	0	0
Purdue University ----------	16	8	2	5	0	0	1
Iowa State University ----------	23	4	5	3	0	3	8
Kansas State University ----------	18	4	0	1	2	2	9
University of Kentucky ----------	2	0	0	0	2	0	0
Louisiana State University ----------	11	0	0	2	9	0	0
University of Maryland ----------	1	0	0	1	0	0	0
University of Massachusetts ----------	7	0	0	0	7	0	0
Michigan State University ----------	21	1	7	1	1	6	5
University of Minnesota ----------	4	0	0	0	0	0	4
University of Missouri ----------	8	0	0	3	4	0	1
University of Nebraska ----------	7	0	0	0	7	0	0
University of New Hampshire ----------	1	0	0	1	0	0	0
Rutgers, The State University ---------	1	0	0	0	1	0	0
New Mexico State University, A, E, & S ----------	1	0	0	0	1	0	0
Cornell University ----------	21	6	4	5	0	1	5
The Ohio State University ----------	24	0	0	0	0	0	24
Oklahoma State University ----------	10	5	4	0	0	0	1
Oregon State University ----------	6	0	4	1	1	0	0
The Pennsylvania State University ----	24	1	3	6	9	1	4
University of Rhode Island ----------	2	0	0	2	0	0	0
University of Tennessee ----------	23	6	5	5	0	2	5
Prairie View A & M College ----------	4	0	0	0	4	0	0
Utah State University ----------	1	0	0	1	0	0	0
Virginia Polytechnic Institute -------	8	4	2	2	0	0	0
Washington State University ----------	2	0	0	0	2	0	0
West Virginia University ----------	3	0	0	0	3	0	0
University of Wisconsin ----------	30	1	0	0	24	0	5
University of Wyoming ----------	3	0	0	0	3	0	0

42 percent of the national total. If the two fields were grouped together, the figures would show that the land-grant institutions awarded 498 master's-level degrees, or 57 percent of the national total.

Of the 344 degrees, 36 percent were awarded by five institutions--the University of Wisconsin (30), Ohio State and Pennsylvania State universities (24 each), and Iowa State and the University of Tennessee (23 each). Further, eight universities awarded over 50 percent of the land-grant total, and 15 universities awarded five or fewer degrees each.

In general the figures seem to show that home economics is a strongly developed field in land-grant institutions as a whole, and that at least 15 institutions are strong producers of master's-level degrees.

6. Master's-Level Degrees in the Humanities

Master's-level degrees in the humanities, as shown in table 18, were awarded by 36 of the land-grant institutions, and the 1,253 degrees were 19 percent of the national total--below the average of 25 percent for all fields combined, but identical with the figure for land-grant doctor's degrees in the same area.

The largest numbers of degrees were in English and journalism (542), followed by foreign languages and linguistics (198), speech and dramatic art (183), music (150), art, general (100), philosophy (42), and fine and applied arts (38). In three of these fields land-grant degrees were from one-fifth to about one-fourth of all U.S. degrees; in the others, the percentages range from less than one-fifth to less than one-tenth.

Of the institutions shown, the largest numbers of degrees were awarded by the University of California (246), followed by Wisconsin (138), Illinois (132), Ohio State (74), and Minnesota (72). Together, these five institutions awarded 662 degrees, or 53 percent of the land-grant total. An additional 241 degrees were conferred by the next five institutions, making a total of 903, or 72 percent, awarded by 10 universities.

It is instructive to notice the number of institutions awarding degrees in each field, and the extent of concentration of strength by institutions. For example, in "art, general," 11 of the 68 institutions awarded degrees; 60 percent of the degrees were awarded by two institutions, and 74 percent by three. In English and journalism, all 36 institutions awarded at least one degree, but almost one-half of the degrees were awarded by six institutions. In fine and applied arts, 10 of the 68 land-grant institutions awarded degrees, and three institutions conferred over two-thirds of the total. In foreign languages and linguistics degrees were conferred by 27 institutions, of which one institution awarded over one-fourth, and three institutions awarded well over one-half of the total. Of the 150 degrees awarded by 19 institutions in music, nearly two-thirds of the degrees were awarded by six institutions, and nearly 40 percent by three institutions. In philosophy 12 institutions, out of 68, awarded

Table 18.--Master's-Level Degrees In the Humanities Awarded by All Institutions, by All Land-Grant Institutions, and by Each Land-Grant Institution, by Field: Aggregate United States, 1958-59

Institution	Total, humanities	Art, general	English and journalism	Fine and applied arts, etc.1/	Foreign languages and linguistics	Music	Philosophy	Speech and dramatic art
1	2	3	4	5	6	7	8	9
(Land-grant degrees as percent of those awarded by all institutions)	19	27	19	9	19	15	21	21
Total degrees, all institutions	6,730	370	2,798	411	1,066	1,022	205	858
Total degrees, land-grant institutions	1,253	100	542	38	198	150	42	183
Auburn University	4	0	3	0	0	0	0	1
University of Arizona	7	1	3	0	0	3	0	0
University of Arkansas	56	0	36	0	1	3	1	15
University of California	246	41	97	2	55	19	7	25
Colorado State University	4	0	4	0	0	0	0	0
University of Connecticut	36	0	31	0	0	5	0	0
University of Delaware	1	0	1	0	0	0	0	0
University of Florida	18	0	14	0	1	0	1	2
University of Georgia	21	5	9	0	2	2	0	3
University of Hawaii	12	0	2	1	0	0	1	8
University of Illinois	132	0	49	15	19	21	7	21
Purdue University	6	0	5	1	0	0	0	0
Iowa State University	4	0	3	1	0	0	0	0
Kansas State University	16	0	7	0	1	3	0	5
University of Kentucky	23	0	7	0	5	9	2	0
Louisiana State University	47	0	19	1	5	14	0	8
University of Maine	6	0	5	0	1	0	0	0
University of Maryland	16	0	3	0	4	0	3	6
University of Massachusetts	6	0	1	0	5	0	0	0
Michigan State University	63	19	14	0	4	11	5	10
University of Minnesota	72	4	27	2	9	10	9	11
Mississippi State University	2	0	2	0	0	0	0	0
University of Missouri	39	5	24	0	2	3	0	5
Montana State College	1	0	1	0	0	0	0	0
University of Nebraska	16	0	3	0	2	0	1	10
University of New Hampshire	4	0	3	0	1	0	0	0
Rutgers, The State University	20	0	10	0	10	0	0	0
New Mexico State University, A, E, & S	5	2	1	0	2	0	0	0
Cornell University	24	0	12	3	7	0	0	2
North Dakota State University	5	0	1	0	0	0	0	4
The Ohio State University	74	0	22	7	9	18	0	18
Oklahoma State University	10	0	9	0	1	0	0	0
The Pennsylvania State University	24	3	8	0	7	1	0	5
University of Puerto Rico	3	0	0	0	3	0	0	0
University of Rhode Island	1	0	1	0	0	0	0	0
South Dakota State College	8	0	6	0	0	0	0	2
Tennessee A & I State University	9	0	6	0	0	0	0	3
University of Tennessee	10	0	5	0	3	0	1	1
Prairie View A & M College	11	0	5	0	0	6	0	0
Utah State University	11	1	8	0	0	2	0	0
University of Vermont	5	0	5	0	0	0	0	0
Washington State University	5	0	3	0	1	0	0	1
West Virginia University	18	0	10	0	1	7	0	0
University of Wisconsin	138	14	50	5	37	11	4	17
University of Wyoming	14	5	7	0	0	2	0	0

1/ Includes fine and applied arts, other specific fields, and not further classified.

42 degrees, and over one-half were from three institutions. Finally, of the 183 degrees awarded by 23 institutions in speech and dramatic art, one-third of the degrees were awarded by three institutions, and nearly 45 percent by four institutions. Evidently the same general situation exists at the master's as at the doctoral level: a relatively small number of institutions carries the great bulk of the work.

7. Master's-Level Degrees in the Physical Sciences, Mathematics and Engineering

Table 19 shows that 53 of the 68 land-grant institutions awarded 4,350 degrees, which were 38 percent of those conferred by all U.S. institutions of higher education in 1958-59. This is significantly above the 25 percent of all master's-level degrees in all fields combined, and compares with 44 percent of the doctor's degrees in the same fields.

By far the largest field of concentration was engineering, with 2,757 degrees--63 percent of all the degrees shown. Following engineering, in the number of degrees awarded, were, in descending order, mathematics and statistics (463), chemistry (428), physics (300), geology (279), earth sciences (61), physical sciences, general (45), and metallurgy (17).

The largest numbers of degrees were awarded by the Massachusetts Institute of Technology (739), the University of California (440), Illinois (429), Purdue (277), Wisconsin (209), and Ohio State (183). These six institutions awarded 2,277 degrees, or 52 percent of the land-grant total. Degrees from the next four institutions totalled an additional 500, making a total for the 10 largest of 2,777, or 64 percent of all land-grant degrees.

The figures show that land-grant degrees, as a percent of all U.S. degrees range from about one-third to 45 percent in the specific fields shown. While the average is somewhat lower than in the biological sciences, and the range somewhat less, there can be little doubt that graduate work in the physical sciences, mathematics, and engineering is strongly developed in the land-grant institutions.

8. Master's-Level Degrees in the Social Sciences and Psychology

It appears from table 20 that 49 of the land-grant institutions awarded 1,407 master's-level degrees in the social sciences and psychology, and that these were 23 percent of the national total. This compares with 31 percent of the doctor's degrees in the same fields, and with 25 percent of the master's-level degrees in all fields combined. If psychology is treated separately from the other fields, then the land-grant institutions awarded 31 percent of all degrees in psychology, and 21 percent of all degrees in the other fields. Graduate work in psychology is therefore more fully developed than in many of the social sciences.

Table 19.--Master's-Level Degrees in the Physical Sciences, Mathematics and Engineering Awarded by All Institutions, by All Land-Grant Institutions, and by Each Land-Grant Institution, by Field: Aggregate United States, 1958-59

Institution	Total	Chemistry	Earth sciences1/	Engineering	Geology	Mathematics and statistics	Metallurgy	Physics	Physical sciences, general, etc.2/
1	2	3	4	5	6	7	8	9	10
(Land-grant degrees as percent of those awarded by all institutions)-------	38	37	42	41	43	31	45	33	16
Total degrees, all institutions ----------	11,431	1,145	147	6,753	643	1,499	38	915	291
Total degrees, land-grant institutions ----------	4,350	428	61	2,757	279	463	17	300	45
Auburn University ----------	32	5	0	15	0	8	0	2	2
University of Alaska ----------	4	0	1	3	0	0	0	0	0
University of Arizona ----------	35	3	0	21	7	0	0	3	1
University of Arkansas ----------	36	5	0	17	9	3	0	2	0
University of California ----------	440	5	15	283	27	43	0	61	6
Colorado State University ----------	10	2	0	7	0	1	0	0	0
University of Connecticut ----------	30	9	0	32	0	5	0	4	0
University of Delaware ----------	51	22	0	22	0	5	0	2	0
University of Florida ----------	64	9	0	44	0	5	0	6	0
University of Georgia ----------	8	4	0	.	0	1	0	2	0
University of Hawaii ----------	2	0	0	0	0	0	0	2	0
University of Idaho ----------	38	7	0	23	7	0	0	1	0
University of Illinois ----------	429	37	0	224	21	101	0	45	1
Purdue University ----------	277	18	0	213	0	39	0	7	0
Iowa State University ----------	116	38	0	53	3	10	4	8	0
Kansas State University ----------	68	11	0	28	10	9	0	10	0
University of Kentucky ----------	40	5	0	24	4	6	0	1	0
Louisiana State University ----------	65	9	0	24	14	9	0	6	3
University of Maine ----------	25	2	0	15	0	5	0	3	0
University of Maryland ----------	49	9	0	20	0	9	1	10	0
Massachusetts Institute of Technology ----------	739	7	11	696	4	12	0	9	0
University of Massachusetts ----------	20	5	0	8	2	5	0	0	0
Michigan State University ----------	90	12	0	52	15	8	0	3	0
University of Minnesota ----------	135	9	0	87	24	3	2	10	0
Mississippi State University ----------	14	1	0	11	2	0	0	0	0
University of Missouri ----------	101	9	0	62	16	7	0	6	1
Montana State College ----------	21	2	0	12	0	5	0	1	1
University of Nebraska ----------	55	20	0	15	9	8	0	3	0
University of Nevada ----------	14	5	0	4	1	0	0	4	0
University of New Hampshire ----------	10	1	0	3	0	2	0	4	0
Rutgers, The State University ----------	36	7	0	10	2	15	0	2	0
New Mexico State University, A, E, & S ----------	15	1	0	7	0	5	0	2	0
Cornell University ----------	95	*	0	70	4	6	0	9	0
University of North Carolina State College of A & E ----------	65	9	0	34	0	2	0	0	0
North Dakota State University ----------	23	8	0	11	0	4	0	0	0
The Ohio State University ----------	183	21	0	113	18	17	0	14	0
Oklahoma State University ----------	113	13	0	76	0	19	0	5	0
Oregon State University ----------	38	8	2	20	2	5	0	1	0
The Pennsylvania State University ---	136	7	14	63	3	9	4	11	25
University of Puerto Rico ----------	2	0	0	0	0	0	0	0	2
University of Rhode Island ----------	9	5	0	4	0	0	0	0	0
Clemson Agricultural College ----------	17	4	0	10	0	0	0	3	0
South Dakota State College ----------	11	4	0	4	0	1	0	2	0
University of Tennessee ----------	77	9	0	47	8	2	6	5	0
A & M College of Texas ----------	100	9	15	63	7	3	0	3	0
Prairie View A & M College ----------	4	0	0	0	0	4	0	0	0
Utah State University ----------	12	3	0	8	0	0	0	1	0
University of Vermont ----------	12	7	0	2	1	1	0	1	0
Virginia Polytechnic Institute ------	57	8	0	40	2	5	0	2	0
Washington State University ----------	17	3	0	7	2	3	0	1	1
West Virginia University ----------	28	2	0	13	7	4	0	2	0
University of Wisconsin ----------	209	20	3	103	20	40	0	21	2
University of Wyoming ----------	53	3	0	13	28	9	0	0	0

1/ Includes geophysics, meteorology, oceanography, and other earth sciences.

2/ Includes physical sciences, not elsewhere classified, and astronomy.

Table 20.--Master's-Level Degrees in the Social Sciences and Psychology Awarded by All Institutions, by All Land-Grant Institutions, and by Each Land-Grant Institution, by Field: Aggregate United States, 1958-59

Institution	Total	American civilization and culture	Anthropology	Area studies	Economics	Geography	History	International relations	Political science and government	Psychology	Sociology	All other social sciences, etc.1/
1	2	3	4	5	6	7	8	9	10	11	12	13
(Land-grant degrees as percent of those awarded by all institutions) -----	23	31	22	12	25	28	24	5	26	31	32	5
Total degrees, all institutions ----------	6,081	45	115	114	664	181	1,643	224	649	1,254	461	731
Total degrees, land-grant institutions ----------	1,407	14	25	14	164	51	388	12	168	390	147	34
Auburn University ----------	9	0	0	0	0	0	5	0	0	4	0	0
University of Arizona ----------	12	0	5	0	1	0	2	0	0	2	2	0
University of Arkansas ----------	9	0	0	0	1	0	3	0	1	3	1	0
University of California ----------	223	0	11	1	31	6	81	8	51	14	20	0
Colorado State University --------	2	0	0	0	1	0	0	0	0	1	0	0
University of Connecticut --------	43	0	0	0	4	0	13	0	7	18	1	0
University of Delaware ----------	16	7	0	0	1	0	4	1	1	2	0	0
University of Florida ----------	28	0	0	1	2	1	7	0	5	8	4	0
University of Georgia ----------	13	0	0	0	1	0	7	0	3	2	0	0
University of Hawaii ----------	19	0	2	2	1	2	1	0	0	8	3	0
University of Illinois ----------	87	0	1	0	15	1	23	0	12	12	5	18
Purdue University ----------	37	0	0	0	4	0	1	0	0	28	4	0
Iowa State University ----------	12	0	0	0	2	0	1	0	0	5	4	0
Kansas State University ----------	14	0	0	0	6	0	4	0	1	2	1	0
University of Kentucky ----------	25	0	1	0	1	2	7	0	2	10	2	0
Louisiana State University --------	76	0	0	0	4	1	22	0	3	31	8	7
University of Maine ----------	5	0	0	0	0	0	2	0	0	3	0	0
University of Maryland ----------	35	0	0	0	4	0	14	0	7	5	5	0
University of Massachusetts ------	9	0	0	0	2	0	4	0	0	3	0	0
Michigan State University --------	57	0	0	0	7	3	12	0	6	16	8	5
University of Minnesota ----------	128	0	2	7	8	3	15	2	8	78	5	0
Mississippi State University -----	5	0	0	0	0	0	1	0	2	0	2	0
Lincoln University ----------	1	0	0	0	0	0	1	0	0	0	0	0
University of Missouri ----------	38	0	0	2	5	2	16	0	2	10	3	0
Montana State College ----------	5	0	0	0	0	0	2	0	0	1	0	2
University of Nebraska ----------	17	0	0	0	5	4	4	0	2	1	1	0
University of Nevada ----------	1	0	0	0	0	0	0	0	0	1	0	0
University of New Hampshire ------	19	0	0	0	2	0	6	0	0	11	0	0
Rutgers, The State University ----	40	0	0	0	3	3	18	0	15	1	0	0
New Mexico State University, A, E, & S ----------	3	0	0	0	0	0	2	0	0	1	0	1
Cornell University ----------	36	3	0	2	1	0	8	1	1	2	18	0
University of North Carolina State College of A & E ----------	8	0	0	0	0	0	0	0	0	8	0	0
North Dakota State University ----	3	0	0	0	3	0	0	0	0	0	0	0
The Ohio State University --------	90	0	1	0	3	1	24	0	7	44	10	0
Oklahoma State University --------	8	0	0	0	1	0	3	0	1	3	0	0
The Pennsylvania State University-	50	0	0	0	8	5	8	0	1	18	10	0
University of Rhode Island -------	6	0	0	0	0	0	4	0	1	0	1	0
South Dakota State College -------	5	0	0	0	4	0	0	0	0	0	1	0
Tennessee A & I State University -	4	0	0	0	0	0	0	0	1	1	2	0
University of Tennessee ----------	30	0	0	0	8	5	1	0	9	4	2	1
A & M College of Texas ----------	2	0	0	0	1	0	0	0	0	0	1	0
Prairie View A & M College -------	1	0	0	0	1	0	0	0	0	0	0	0
Utah State University ----------	21	0	0	0	3	0	1	0	3	6	8	0
University of Vermont ----------	4	0	0	0	2	0	0	0	0	2	0	0
Virginia State College ----------	1	0	0	0	0	0	1	0	0	0	0	0
Washington State University ------	17	0	2	0	0	0	3	0	1	4	7	0
West Virginia University ----------	13	0	0	0	0	0	6	0	3	3	1	0
University of Wisconsin ----------	109	0	0	1	17	12	48	0	12	12	7	0
University of Wyoming ----------	10	4	0	0	1	0	3	0	0	2	0	0

1/ Includes social sciences, general.

Psychology leads the other fields in the number of degrees awarded (390). Following, in order, were history (388), political science (168), economics (164), sociology (147), geography (51), anthropology (25), American civilization and culture, and area studies (14 each), and international relations (12).

The percent of land-grant degrees in the individual fields ranges from a low of five in international relations to a high of 32 in sociology. In the larger fields--economics, history, political science, psychology and sociology--the range is between one-fourth and one-third. However, if one looks at the institutional totals carefully, it becomes apparent that, even in the more popular fields, a few institutions award the great bulk of the degrees. The University of California leads the list, with 223 degrees, followed by Minnesota (128), Wisconsin (109), Ohio State (90), Illinois (87), and Louisiana State University (76). Together these six institutions awarded 51 percent of the land-grant total, and the largest 10 institutions awarded 64 percent of the total. In economics, three institutions awarded 38 percent of all degrees; in history, three institutions awarded one-third of the total; in political science, three institutions awarded 46 percent; and in sociology, four institutions awarded 39 percent of the total. As we observed earlier in the humanities, the bulk of the graduate work in the social sciences is concentrated in a relatively small number of institutions.

The same observations which we mentioned earlier, in our discussion of doctoral degrees in the social sciences, seem to apply here also. We note, for example, that only three institutions awarded degrees in American civilization and culture; only four in international relations; and only six in area studies--all fields in which expansion seems desirable in the national interest. We do not suggest that students should be forced to work in fields for which they have no interest but that institutions have it within their power, within certain limits, to foster an interest by strengthening their programs and faculties. These are fields in which some additional support would be beneficial both for individual students and for the country at large.

9. Master's-Level Degrees in Applied Social Sciences

The figures in table 21 show that the land-grant institutions conferred 467 degrees, or 59 percent of the national total, in the applied social sciences. Although this is less than the 65 percent of the doctor's degrees in the same fields, it is still much above the average of 25 percent for master's-level degrees in all fields combined.

The figures show that the largest numbers of degrees (315) were in agricultural economics--99 percent of the national total. Social work and social administration with 74 degrees (50 percent of the national total) is next, followed by industrial relations (63 degrees--54 percent of the national total), and public administration (13 degrees--7 percent of the national total). Thirteen different institutions awarded at least

Table 21.--Master's-Level Degrees in Applied Social Sciences Awarded by All Institutions, by All Land-Grant Institutions, and by Each Land-Grant Institution, by Field: Aggregate United States, 1958-59

Institution	Total, applied social sciences	Agricultural economics	Industrial relations	Public administration	Social work, social administration	Applied social sciences, all other
1	2	3	4	5	6	7
(Land-grant degrees as percent of those awarded by all institutions)	59	99	54	7	50	8
Total degrees, all institutions	787	318	116	178	149	26
Total degrees, land-grant institutions	467	315	63	13	74	2
Auburn University	3	3	0	0	0	0
University of Arizona	2	2	0	0	0	0
University of Arkansas	3	2	0	0	1	0
University of California	2	2	0	0	0	0
University of Connecticut	3	3	0	0	0	0
University of Delaware	5	4	0	0	0	1
University of Florida	6	6	0	0	0	0
University of Georgia	10	10	0	0	0	0
University of Illinois	32	16	16	0	0	0
Purdue University	18	18	0	0	0	0
Iowa State University	15	15	0	0	0	0
Kansas State University	8	8	0	0	0	0
University of Kentucky	6	6	0	0	0	0
Louisiana State University	5	5	0	0	0	0
University of Maine	2	2	0	0	0	0
University of Maryland	7	5	2	0	0	0
University of Massachusetts	7	7	0	0	0	0
Michigan State University	17	17	0	0	0	0
University of Minnesota	36	7	18	11	0	0
Mississippi State University	4	4	0	0	0	0
University of Missouri	12	12	0	0	0	0
Montana State College	9	9	0	0	0	0
University of Nebraska	13	13	0	0	0	0
University of New Hampshire	1	1	0	0	0	0
Rutgers, The State University	2	2	0	0	0	0
New Mexico State University, A, E, & S	3	3	0	0	0	0
Cornell University	30	16	14	0	0	0
University of North Carolina State College of A & E	9	9	0	0	0	0
North Dakota State University	5	5	0	0	0	0
The Ohio State University	52	21	0	0	31	0
Oklahoma State University	12	12	0	0	0	0
Oregon State University	4	4	0	0	0	0
The Pennsylvania State University	9	9	0	0	0	0
University of Rhode Island	1	1	0	0	0	0
Clemson Agricultural College	5	5	0	0	0	0
South Dakota State College	2	2	0	0	0	0
University of Tennessee	18	6	12	0	0	0
A & M College of Texas	6	6	0	0	0	0
Prairie View A & M College	4	4	0	0	0	0
Utah State University	8	8	0	0	0	0
University of Vermont	1	1	0	0	0	0
Virginia Polytechnic Institute	3	3	0	0	0	0
Washington State University	2	2	0	0	0	0
West Virginia University	1	0	1	0	0	0
University of Wisconsin	62	17	0	2	42	1
University of Wyoming	2	2	0	0	0	0

10 degrees, and six institutions awarded 50 percent of the total. With the exception of agricultural economics, however, in which all but one institution awarded some degrees, most of the degrees were awarded by a small handful of institutions--only two granting degrees in public administration and social work, and six in industrial relations. In view of the importance of these fields, other institutions might well consider trying to attract students into working for advanced degrees in these fields.

10. Master's-Level Degrees in General Arts and Science Programs

The number and percent of degrees awarded by land-grant institutions in general arts and sciences fields are shown in table 22. One hundred and forty-eight degrees, or one-quarter of the national total, were awarded by 14 institutions. The largest numbers of degrees were awarded by Oregon State University (64), followed by Oklahoma State (37), and the University of Idaho (20). These three institutions awarded over 80 percent of the total shown.

Table 22.--Master's-Level Degrees in General Programs and Miscellaneous Fields Awarded by All Institutions, by All Land-Grant Institutions, and by Each Land-Grant Institution, by Field: Aggregate United States, 1958-59

Institution	Total	Arts, general program	Arts and sciences, general program	Sciences, general program	Miscellaneous fields1/
1	2	3	4	5	6
(Land-grant degrees as percent of those awarded by all institutions) ----	25	7	9	36	13
Total degrees, all institutions ----------	592	73	82	352	85
Total degrees, land-grant institutions ----------	148	5	7	125	11
University of Arkansas ----------	7	0	0	7	0
University of California ---------	8	0	0	0	8
University of Florida ----------	1	0	0	0	1
University of Idaho ----------	20	5	0	15	0
Iowa State University ----------	1	0	0	1	0
Massachusetts Institute of Technology ----------	2	0	1	1	0
University of Minnesota ----------	1	0	1	0	0
Montana State College ----------	1	0	0	0	1
Cornell University ----------	1	0	0	0	1
Oklahoma State University --------	37	0	0	37	0
Oregon State University ----------	64	0	3	61	0
University of Tennessee ----------	2	0	0	2	0
University of Wisconsin ----------	2	0	2	0	0
University of Wyoming ----------	1	0	0	1	0

1/These are degrees classified in the Earned Degrees study under the heading "Major Fields of Study Not Elsewhere Classified," p. 184-5.

Part III--Summary and Conclusions

The contributions of the land-grant institutions, both individually and as a group, to the production of earned doctor's-and master's-level degrees in the principal fields of graduate work have been shown in parts I and II of this report. A comparison of the land-grant contributions in different areas and a summary of the results is presented in part III.

Data on the number and percent of land-grant degrees compared to all U.S. degrees, at both levels of graduate work are given in table 23. These data permit certain generalizations about the relative strength of the land-grant institutions as a whole.

First, we may note those areas or fields in which the land-grant degrees were above the average percent of degrees in all fields combined. Thus, in agriculture and forestry, at both the doctor's-and master's-degree levels, land-grant degrees were about 93 percent of the national total. Next highest is home economics, with more than 65 percent of all degrees, at both levels. In the applied social sciences, land-grant degrees were nearly 60 percent at the master's level, and 65 percent of the doctorates. In the natural science areas as well, the land-grant percentages were well above those for all fields combined--47 and 54 percent respectively of all master's and doctor's degrees in the biological sciences; and 38 and 44 percent respectively in the physical sciences, mathematics, and engineering. (In engineering alone the figures were 41 and 49 percent respectively.) Finally, in psychology land-grant degrees were 31 and 38 percent of the national totals.

The other major areas shown are education, the humanities, and the social sciences. In education, land-grant institutions awarded 19 percent of all master's-level degrees, and 32 percent of all doctor's degrees in the Nation. In the humanities, the land-grant contribution was 19 percent of all graduate degrees at both levels. And in the social sciences (minus psychology) land-grant degrees were 21 percent of the master's, and 27 percent of the doctor's degrees. In all of these fields, land-grant degrees were a smaller part of the national total than the average of 25 percent of the master's and 38 percent of the doctor's degrees, in all fields combined.

Second, table 24 shows the number of graduate degrees as a percent of all degrees (including bachelor's and first-professional) awarded by the land-grant institutions from 1949-50 through 1958-59. It is recognized that small yearly variations are probably of minor significance, but that the result of small yearly changes reinforcing each other in the same direction may afford some clues to the general trends in the relationship of graduate to undergraduate work.

Table 23.--Number and Percent of Master's-Level and Doctor's Degrees Awarded by Land-Grant Institutions, by Area: Aggregate United States, 1958-59

Area	Number of degrees awarded by land-grant institutions		Land-grant degrees as percent of degrees awarded by all institutions	
	Master's-level	Doctor's	Master's-level	Doctor's
All fields ----------	17,549	3,583	25.3	38.3
Agriculture and forestry ----------	1,099	349	92.9	92.8
Biological sciences--	930	560	46.5	53.6
Business and commerce----------	796	36	17.9	26.2
Education----------	6,093	503	19.4	31.5
Home Economics-------	344	17	67.9	65.4
Humanities ----------	1,253	189	18.6	19.3
Physical sciences, mathematics and engineering -------	4,350	1,220	38.1	43.5
Engineering -----	(2,757)	(351)	(40.8)	(49.2)
Social sciences and psychology --------	1,407	531	23.1	30.8
Social sciences, except psychology-	(1,017)	(290)	(21.1)	(26.6)
Psychology ------	(390)	(241)	(31.1)	(38.0)
Applied social sciences ----------	467	78	59.3	64.5
Total other[1/] ---------	810	100	4.6	2.8

1/ Includes fields such as architecture, law, library science, health sciences, religion and theology, and unidentified fields.

Table 24 shows that in 1949-50, master's-level degrees were 11.8 percent of all land-grant degrees. This is practically the same as the 11 percent for all U.S. institutions (not shown in the table). The percentage increased moderately in both 1950-51 and 1951-52, but declined slightly in 1955-56, and therafter was relatively unchanged.[1/] While the percentage does show an increase from about 12 to 17 percent over the decade, one does not get the impression of a particularly strong, consistent expansion.

1/ According to the most recent figures, master's-level degrees as a percent of all land-grant degrees rose to 17.5 percent in 1959-60, and to 18.3 percent in 1960-61. See Preliminary Report of Statistics of Land-grant Colleges and Universities, U.S. Department of Health, Education, and Welfare, U.S. Office of Education (Washington: OE-50025, Nov. 8, 1961), p.5.

The figures also show that in 1949-50, doctor's degrees were 1.9 percent of all land-grant degrees--compared with 1.3 for all U.S. institutions. The growth during the decade was more pronounced than at the master's level, but was also uneven, reaching its high point (4.5 percent) in 1953-54, and declining slightly thereafter.[2/]

Table 24.--Number of Bachelor's and Higher Degrees Awarded, and Master's and Doctor's Level Degrees as a Percent of All Degrees at Land-Grant Institutions: Aggregate United States, 1949-50 Through 1958-59

Year[1/]	Number of bachelors and higher degrees awarded by land-grant institutions	Graduate degrees as a percent of all bachelor's and higher degrees awarded by land-grant institutions		
		Master's-level degrees	Doctor's degrees	Master's-level and doctor's degrees
1949-50 --	121,709	11.8	1.9	13.7
1950-51 --	107,639	15.4	2.5	17.9
1951-52 --	89,789	17.2	3.1	20.3
1952-53 --	82,022	17.3	3.8	21.1
1953-54 --	79,102	17.3	4.5	21.8
1954-55 --	79,268	17.8	4.4	22.2
1955-56 --	84,853	16.9	4.0	20.9
1956-57 --	91,950	16.6	3.6	20.2
1957-58 --	98,654	16.3	3.4	19.7
1958-59 --	103,933	16.9	3.4	20.3

[1/] Figures through 1956-57 include degrees for West Virginia State College, which ceased to exist as a land-grant institution, as a result of state legislative action, as of July 1, 1957.

For all graduate degrees combined, the percentage rose from 13.7 in 1949-50 to 20.3 in 1958-59 (and, as footnotes 1 and 2 show, to 22.2 percent in 1960-61). This gradual increase in the relative position of graduate to undergraduate degrees is not unique in the land-grant institutions, but reflects the general emphasis in all U.S. higher education on

[2/] Ibid. In 1959-60, doctorates were 3.7 percent, and in 1960-61, 3.9 percent of all land-grant degrees. The trend therefore, at both the doctoral and master's-levels, again seems to be upwards.

lengthening the period of formal education and giving greater attention to graduate and professional work. But in noting the trend, we must observe that there is nothing inevitable about its continuation, either in all institutions in general, or in the land-grant institutions in particular. The land-grant institutions are primarily public institutions (M.I.T. is private, and Cornell is only partly public), and are therefore especially responsive to public and legislative opinions and actions. Since undergraduate enrollments may well increase more rapidly over the next five years than graduate enrollments, the tendency in many institutions may be to expand at the undergraduate rather than at the graduate level. The recent modest gains of graduate education relative to undergraduate are therefore by no means assured of continuance in the next decade, unless further positive efforts are made to strengthen graduate programs and institutions.

Some impression of the shifts within fields and areas can be obtained from the figures presented next in table 25. Here we contrast the number of degrees awarded in each of the major fields, at the beginning and the end of the decade. In examining the figures the reader should bear in mind that, as was pointed out earlier, over the decade, the total number of master's-level degrees awarded by the land-grant institutions increased by 22 percent in all fields combined, and the number of doctorates by 53 percent.

It appears from the figures that in agriculture and forestry, the number of master's-level degrees declined from 1,246 to 1,099, and doctor's degrees increased by seven.[3/]

In the biological sciences, the figures show a decline from 994 to 930 master's-level degrees. As the footnote to the table points out, however, the figure for 1949-50 may be misleadingly low because of the many "unspecified" science degrees reported for that year. In that case, the decline would be greater than the figures indicate.

At the doctoral level in the biological sciences, there is no mistaking the trend--an increase from 353 to 560 degrees, or 59 percent--compared with 53 percent in all fields.

In business and commerce, the figures show an increase from 511 to 796 at the master's level, or 56 percent. At the doctoral level, the 36 degrees awarded in 1958-59 is three and one-half times greater than the 8 in 1949-50.

[3/] Apparently neither of these figures includes degrees in agricultural economics. There were 315 such master's degrees in 1958-59 (shown on table 25 with "Applied sciences") making a combined total for agriculture and agricultural economics of 1,414. In 1949-50 there were 1,410 master's degrees in "Agriculture"--presumably including agricultural economics. For the two groups together, therefore, there is a difference of only 4 degrees. For the 1949-50 figures see Statistics of Land-Grant Colleges and Universities: Year Ended June 30, 1950 (Washington: Bulletin 1951, No. 4), p. 6.

Table 25.--Doctor's and Master's-Level Degrees Awarded by Land-Grant Institutions, by Area: Aggregate United States, 1949-50 and 1958-59

Area	Master's-level degrees 1949-50	Master's-level degrees 1958-59	Doctor's degrees 1949-50	Doctor's degrees 1958-59
1	2	3	4	5
All fields	14,353	17,549	2,340	3,583
Agriculture and forestry	1,246	1,099	342	349
Biological sciences 1/	994	930	353	560
Business and commerce	511	796	8	36
Education	2,987	6,093	211	503
Home economics	341	344	14	17
Humanities	1,115	1,253	111	189
Physical sciences, mathematics and engineering 1/	3,622	4,350	949	1,220
Engineering	(2,183)	(2,757)	(222)	(351)
Social sciences and psychology-	1,297	1,407	281	531
Social sciences except psychology	(931)	(1,017)	(184)	(290)
Psychology	(366)	(390)	(97)	(241)
Applied social sciences 2/	NA	467	NA	78
Total other	2,240	810	71	100

1/ The figures for degrees in the natural sciences in 1949-50 are probably understated because of the large number of degrees in "Sciences Unspecified." See Earned Degrees Conferred by Higher Educational Institutions, 1949-50 (Washington: Federal Security Agency, Office of Education Circular No. 282, December, 1950).

2/ The Earned Degrees study for 1958-59 (Office of Education Circular No. 636, 1961) classified under "Applied Social Sciences" the following fields: Agricultural Economics, Foreign Service Programs, Industrial Relations, Public Administration, Social Work--Social Administration, and All Other Applied Social Sciences. However, the figures for 1949-50 show separate classifications only for Public Administration and Social Work. Because of this difference, no attempt has been made to show Applied Science Degrees for 1949-50, at either the master's or doctor's level.

In education, the increases were over 100 percent at the master's level, and about 140 percent at the doctoral level.

Degrees in home economics showed very slight increases, at both levels.

In the humanities, the increase at the master's level was about 12 percent--from 1,115 to 1,253 degrees. At the doctor's level, however, the increase was very substantial--about 70 percent.

Master's level degrees in the physical sciences, mathematics and engineering rose from 3,622 to 4,350 degrees, or 20 percent--slightly below the average for all fields combined. At the doctoral level, the increase was 29 percent--considerably less than the average for all fields combined. In engineering alone, the growth rate was greater than for the whole area, viz., 26 percent at the master's and 58 percent at the doctoral level.

In the social sciences and psychology combined, master's-level degrees increased by a modest 9 percent, and doctor's degrees by a sizeable 89 percent. Much of the increase at the doctoral level, however, results from the 149 percent increase in doctor's degrees in psychology alone.

Summarizing the situation at the master's-degree level, the fields of relatively little growth have been agriculture and forestry, home economics, and the biological sciences. Moderate to sizeable increases occurred in the social sciences (including psychology), the humanities, and the physical sciences, mathematics, and engineering. Very large gains were scored in business and commerce and in education.

At the doctoral level also, there have been strongly contrasting trends. The more stable fields have been agriculture and forestry, and home economics. In the physical sciences area, the increase has been over one-quarter, and in the biological sciences, over one-half. Doctoral degrees in the humanities increased by about 70 percent, in the social sciences and psychology by almost 90 percent, and in psychology alone by nearly 150 percent. Degrees in education increased by about 140 percent and in business and commerce by 350 percent.

The results of these uneven growth rates on the distribution of degrees within the land-grant institutions are evident in table 26, where the number of degrees in each major area is shown as a percent of all degrees, in both 1949-50 and 1958-59. The following are a few of the highlights:

It is evident that there has been a relative decline in the number of earned degrees awarded in agriculture and forestry, and in home economics, at both the master's and doctor's level.

In the biological sciences at the master's level, the decline from 6.9 to 5.3 percent is small; as is also the increase, at the doctoral level, from 15.1 to 15.7 percent.

In business and commerce and in education, as one would expect from the earned degree figures on table 25, there were significant increases at both the master's and doctor's levels.

In the humanities there was a relative decline at the master's level, and a slight increase at the doctor's level.

In the physical sciences, and mathematics and engineering combined, there was a slight decline at the master's level, and a sharper one at the doctor's level. But in engineering alone, the distribution of degrees at both levels has increased slightly.

In the social sciences and psychology combined, and in psychology alone, there have been slight declines at the master's level, and moderate increases at the doctor's level.

Table 26.--Percent Distribution of Doctor's and Master's-Level Degrees Awarded by Land-Grant Institutions, by Areas: Aggregate United States 1949-1950 and 1958-59

Area	Percent of master's-level degrees		Percent of doctor's degrees	
	1949-50	1958-59	1949-50	1958-59
1	2	3	4	5
All fields, total	100.0	100.0	100.0	100.0
Agriculture and forestry	8.7	6.3	14.6	9.7
Biological sciences[1/]	6.9	5.3	15.1	15.7
Business and commerce	3.6	4.5	.3	1.0
Education	20.8	34.7	9.0	14.0
Home economics	2.4	2.0	.6	.1
Humanities	7.8	7.1	4.7	5.3
Physical sciences, mathematics, and engineering[1/]	25.2	24.8	40.6	34.1
Engineering	15.2	15.7	9.5	9.8
Social sciences and psychology	9.0	8.0	12.0	14.8
Psychology	2.6	2.2	4.1	6.7
Applied social sciences[2/]	NA	2.7	NA	2.2
Other fields	15.6	4.6	3.0	2.8

[1/] See the first footnote, above, under table 25.

[2/] See the second footnote, above, under table 25.

What is the interpretation of these facts? One way of understanding the nature of the changes taking place in individual areas is to group those of a similar nature. If this is done, an informal tabulation will show the following percentages of master's degrees awarded:

Percent of Master's Degrees Awarded, 1949-50 and 1958-59

	1949-50	1958-59
Agriculture and Forestry	8.7	6.3
Business and Commerce	3.6	4.5
Education	20.8	34.7
Engineering	15.2	15.7
Home Economics	2.4	2.0
Total Professional Fields:*	50.7	63.2
Biological Sciences	6.9	5.3
Physical Sciences and Math	10.0	9.1
Total Natural Sciences:	16.9	14.4
Social Sciences and Psychology	9.0	8.0
Humanities	7.8	7.1
Total Social Sciences and Humanities:	16.8	15.1

*The number and percent of professional degrees, at both the master's and doctor's level are undoubtedly higher than shown, because psychology has been included with the social sciences. Many of the degrees in psychology, especially at the doctor's level, are undoubtedly in clinical psychology, and so, if the exact number were known, should be included as professional degrees.

The number of master's degrees awarded in the natural science areas, and in the social sciences and humanities, has declined as a proportion of all land-grant master's degrees, and the number of professional master's degrees has sharply and substantially increased as a percent of all master's degrees.

A similar tabulation for doctor's degrees shows the following:

Percent of Doctor's Degrees Awarded, 1949-50 and 1958-59

	1949-50	1958-59
Agriculture and Forestry	14.6	9.7
Business and Commerce	.3	1.0
Education	9.0	14.0
Engineering	9.5	9.8
Home Economics	.6	.1
Total Professional Fields:	34.0	34.6
Biological Sciences	15.1	15.7
Physical Sciences and Mathematics	31.1	24.3
Total Natural Sciences:	46.2	40.0
Social Sciences and Psychology	12.0	14.8
Humanities	4.7	5.3
Total Social Sciences and Humanities:	16.7	20.1

The trends here are rather different. Although there was a slight increase in the proportion of degrees awarded in professional fields, the big changes were the decline in the natural sciences, and the increase in the social sciences and humanities combined. As noted earlier, psychology accounts for a major part of the increase in the social sciences, and many of these degrees are undoubtedly in clinical psychology. But it seems clear that there has been a moderate shift in emphasis.

In concluding this study, a few tentative observations may be offered. The degree to which they may apply to any particular institution will obviously vary considerably because of the diversity within the land-grant institutions as a whole.

In the world of higher education in general, more and more prestige seems to be attached to graduate, and especially doctoral work. This is a reflection of the growing popular appreciation of the importance of research to defense and economic growth, and of the key role played by the most highly educated individuals in our educational enterprise, in all of the professions, in business, and in government.

Important as graduate work is, however, it would serve no useful institutional or social purpose for every institution whatsoever to attempt to offer graduate work. The history of graduate education in the United States seems to show that graduate education can flourish only on the basis of sound undergraduate preparation. Those institutions, therefore, which see their primary function as that of offering only undergraduate work should not feel under any psychological or "prestige" disadvantage if they concentrate on improving the quality of their

undergraduate programs. In doing so, they are performing an educational service of basic importance, without which graduate education could hardly thrive.

The same attention to quality obviously applies also at the graduate level. Doctoral work is very expensive, and the national need for good master's programs is so great that a considerable expansion in the number of master's degrees awarded, without any decline and even with an improvement in their quality, is much to be desired. In the areas in which expansion might take place, a more even balance between the "academic" fields (or the basic arts and sciences), on the one hand, and the professional fields, on the other, would be advantageous, both for the institutions themselves and for the Nation at large. We do not suggest a cutback in the number of master's degrees in professional fields, but rather an expansion in the degrees in the basic academic fields.

Those institutions which have long-established doctoral programs in most major fields have a greater degree of freedom than some of the newer institutions to alter the balance between graduate and undergraduate work on the one hand, and master's and doctor's programs on the other. The figures in table 24, above, show that both master's and doctor's degrees, as a percent of all land-grant degrees, were higher in 1958-59 than in 1949-50. But the highest percentages in both were in 1954-55, and the figures since then have shown slight declines. In the absence of a deliberate decision by the institutions to emphasize and strengthen graduate and doctoral work, the balance between graduate and undergraduate work may not change in favor of graduate work, and in fact may well decline further. We would not consider such a decline favorable for the Nation at large, and we therefore urge those who are in a position to influence graduate education policy to give this matter their serious attention and a high priority.

The same observations made for doctoral degrees may be applied to master's degrees: both the land-grant institutions and the Nation at large would benefit from an expansion of work in the basic social sciences and humanities. Should such an expansion occur, a distribution of doctoral degrees which would result in one-third being awarded in the various professional fields, with the remainder divided between the social sciences and humanities, would be more consonant with today's needs for highly educated manpower. This result will not be achieved, however, by simply letting things take their natural course, but will require explicit decisions to strengthen and expand graduate work in this direction.

List of Land-grant Institutions, by State

ALABAMA:
Alabama Agricultural and Mechanical College
Auburn University

ALASKA: University of Alaska

ARIZONA: University of Arizona

ARKANSAS:
Agricultural, Mechanical, and Normal College
University of Arkansas

CALIFORNIA: University of California

COLORADO: Colorado State University

CONNECTICUT: University of Connecticut

DELAWARE:
Delaware State College
University of Delaware

FLORIDA:
Florida Agricultural and Mechanical University
University of Florida

GEORGIA:
Fort Valley State College
University of Georgia

HAWAII: University of Hawaii

IDAHO: University of Idaho

ILLINOIS: University of Illinois

INDIANA: Purdue University

IOWA: Iowa State University of Science and Technology

KANSAS: Kansas State University of Agriculture and Applied Science

KENTUCKY:
Kentucky State College
University of Kentucky

LOUISIANA:
Louisiana State University and Agricultural and Mechanical College
Southern University and Agricultural and Mechanical College

MAINE: University of Maine

MARYLAND:
Maryland State College, University of Maryland
University of Maryland

MASSACHUSETTS:
Massachusetts Institute of Technology
University of Massachusetts

MICHIGAN: Michigan State University of Agriculture and Applied Science

MINNESOTA: University of Minnesota

MISSISSIPPI:
Alcorn Agricultural and Mechanical College
Mississippi State University

MISSOURI:
Lincoln University
University of Missouri

MONTANA: Montana State College

NEBRASKA: University of Nebraska

NEVADA: University of Nevada

NEW HAMPSHIRE: University of New Hampshire

NEW JERSEY: Rutgers, The State University

NEW MEXICO: New Mexico State University of Agriculture, Engineering and Science

NEW YORK: Cornell University

NORTH CAROLINA:
Agricultural and Technical College of North Carolina
State College of Agriculture and Engineering, University of North Carolina

NORTH DAKOTA: North Dakota State University

OHIO: Ohio State University

OKLAHOMA:
Langston University
Oklahoma State University of Agriculture and Applied Science

OREGON: Oregon State College

PENNSYLVANIA: Pennsylvania State University

PUERTO RICO: University of Puerto Rico

RHODE ISLAND: University of Rhode Island

SOUTH CAROLINA:
Clemson Agricultural College
South Carolina State College

SOUTH DAKOTA: South Dakota State College of Agriculture and Mechanic Arts

TENNESSEE:
Tennessee Agricultural and Industrial State University
University of Tennessee

TEXAS:
Agricultural and Mechanical College of Texas
Prairie View Agricultural and Mechanical College

UTAH:
Utah State University of Agriculture and Applied Science

VERMONT: University of Vermont and State Agricultural College

VIRGINIA:
Virginia Polytechnic Institute
Virginia State College

WASHINGTON: Washington State University

WEST VIRGINIA: West Virginia University

WISCONSIN: University of Wisconsin

WYOMING: University of Wyoming

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OKLAHOMA:
Langston University
Oklahoma State University of Agriculture and Applied Science

OREGON: Oregon State College

PENNSYLVANIA: Pennsylvania State University

PUERTO RICO: University of Puerto Rico

RHODE ISLAND: University of Rhode Island

SOUTH CAROLINA:
Clemson Agricultural College
South Carolina State College

SOUTH DAKOTA: South Dakota State College of Agriculture and Mechanic Arts

TENNESSEE:
Tennessee Agricultural and Industrial State University
University of Tennessee

TEXAS:
Agricultural and Mechanical College of Texas
Prairie View Agricultural and Mechanical College

UTAH:
Utah State University of Agriculture and Applied Science

VERMONT: University of Vermont and State Agricultural College

VIRGINIA:
Virginia Polytechnic Institute
Virginia State College

WASHINGTON: Washington State University

WEST VIRGINIA: West Virginia University

WISCONSIN: University of Wisconsin

WYOMING: University of Wyoming

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